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YEAR
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1943



[Vol 56]

ENGINEERING
SOCIETY

THE UNIVERSITY OF TORONTO



"To the Future!"

YUBA DREDGES are favorably known and have been used throughout the world for many years. Long standing personal and business friendships were built up thereby, making every member of Yuba's organization keenly aware of the global nature of this war. They are personally interested because of their direct acquaintance with dredgemen in many of the countries affected. "Business as usual" is temporarily a thing of the past, for reasons which they also understand fully, and which are results of enemy action and domestic economic rulings.

"What to do about it?" The answer is simple. Everything possible to win the war and to do it quickly! That is the Yuba spirit and intent. After the war, again there will be new Yuba dredges, designed and built by a company having access to widely varying, actual field experience. We send greetings and best wishes to Yuba friends wherever they may be, with the sincere hope that, in the not too distant future, every placer dredge again will be swinging and digging as usual, to the sounds of ringing metal, groaning bucket lines and splashing water which are music to the dredgeman.

When the time comes again. Yuba dredges and parts will be of the same high standard as in the past, but also designed to do the jobs of the future. Many dredging areas will have to be re-appraised and new plans made to mine them economically and profitably. Let Yuba help in the design of your future dredge or in rebuilding and re-equipping your present one.



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WRITE OUR LIBRARY FOR CONCRETE INFORMATION

For many years we have maintained a service department which gives technical advice to Engineers, Architects and Contractors. Literature is also available for distribution covering many uses of concrete and reinforced concrete.

If you feel that we can aid you in avoiding or reducing the use of critical war materials or aid you in solving any of your problems relating to concrete work get in touch with the service department.



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Cyanamid Ore Dressing Laboratory Notes

Arsenic can be produced from low-grade ores and tailings by a new technique developed in the Cyanamid Ore Dressing Laboratory. By a simple selective flotation procedure the following results were obtained on a low-grade tailing containing pyrite, pyrrhotite and arsenopyrite in a gangue of quartz, chlorite and biotite mica:

	Per Cent Wgt.	Arsenic Per Cent	Distri.	Ratio Concen.
Feed	100.00	0.24	100.00	—
Arsenopyrite Conc.	1.19	18.10	88.06	84 into 1
Pyrite “	0.51	0.33	0.70	—
Pyrrhotite “	3.59	0.37	5.44	—
Final Tail	94.71	0.015	5.80	—

The grade of concentrate is suitable for roasting to produce white arsenic. Inquiries are invited from mining companies whose ores or tailings contain arsenopyrite.

North American Cyanamid Ltd.

ROYAL BANK BLDG.

TORONTO

The Engineering Institute of Canada

FOUNDED 1887

The Engineering Institute of Canada is a Dominion wide organization of engineers in all sections of the profession. It operates through twenty-five branches in the main centres of Canada.

It publishes the Engineering Journal, a monthly technical journal, and works through the medium of its Council and many committees. One of these deals with the problems of the young engineer in which the Institute is vitally interested.

In four provinces the Institute has co-operative agreements with the local provincial associations of professional engineers, providing for common membership.

In Toronto there is an active branch of the Institute founded in 1906, which meets regularly in winter months. Associated with it is a Junior Section for all engineers up to the age of thirty-five. Undergraduate engineers are welcome to all meetings.

Student Prizes

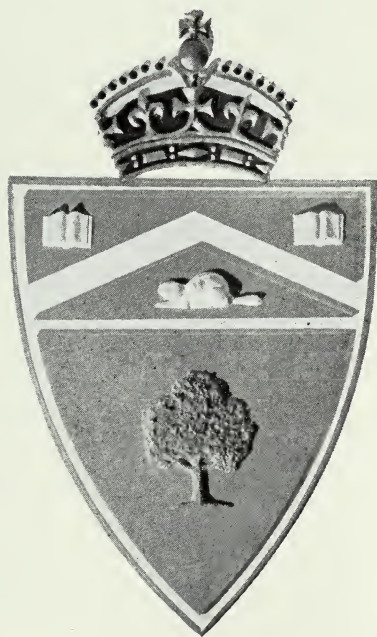
The Institute awards annually a number of valuable prizes for students. Some of these are open to all students, others only to Members of the Institute, including Student Members.

General Secretary,
L. AUSTIN WRIGHT
2050 Mansfield St.,
Montreal, Que.



TORONTO BRANCH
Secretary-Treasurer,
S. H. deJONG,
Electrical Building,
University of Toronto.

Transactions
and
Year Book
1943



Engineering Society

THE UNIVERSITY OF TORONTO

Roll of Service

The Roll of Service compiled last year and in 1941, has been expanded to include the names of those who have since joined the Active Service Forces. To make a complete roll in the time available has been an impossible task and there are doubtless many omissions for which we beg forgiveness.

We wish to acknowledge the very kind co-operation of the Record's Office of the University of Toronto.

As in the 1942 edition of *Transactions*, we are including the second list of casualties.

CASUALTIES

AGNEW, R. M.	Missing after air operations, March 29th, 1943.
CRAWFORD, R. C., '35	Died of wounds overseas, July, 1942.
DAVIS, G. R. C.	Killed in action Middle East, May 29th, 1942.
BULANDA, J. P.	Missing after air operations, December, 1942.
GRIFFIN, W. M. D.	Missing after air operations, January, 1943.
HOLMSTEAD, D. S., '35	Died of wounds in Libyan campaign, November, 1942.
McKILLIP, R. H.	Killed during air operations, March 23rd, 1942.
PENSA, A.	Killed in aerial operations over Shropshire, Eng., 1941.
POLLEY, E. V., '42	Accidentally killed in England, March 3rd, 1943.
RITCH, A. F. G.	Missing after air operations overseas, March 13th, 1943.
WALKER, L. C. A.	Missing after air operations, September 26th, 1942.

Roll of Service

Arnott, B. M., '33	R.C.E.
Adlard, L. S., '15	Indian Army
Angus, D. L., '41	R.C.O.C.
Abbot, R. P., '40	R.C.N.V.R.
Anderson, G. W., '42	C.A.C.
Aylesworth, J. W., '42	R.C.A.F.
Alexander, J. H., '42	R.C.E.
Abell, Miss H. C.	C.W.A.C.
Anderson, B. L., '35	C.O.R.U.
Ambrose, H. G. K., '42	R.C.O.C.
Armstrong, H. D., '30	R.C.N.
Armstrong, N. A., '41	U.S. Artillery
Alexander, W. R., '35	R.C.N.V.R.
Anderson, R. W., '34	R.C.E.
Blake, W., '35	R.C.C.S.
Buchanan, F. M., '15	R.C.A.F.
Barnett, H. W., '40	R.C.E.
Beach, M. E., '41	U.S. Army Air Corps
Burns, K. F., '40	U.S. Army Vet Corps
Brown, Miss J. F., '30	R.C.A.F. (W.D.)
Burgess, T. D., '42	
Baylay, W. F., '31	R.C.O.C.
Bruce, D. S., '42	R.N.V.R.
Brown, W. E. K., '41	R.C.E.
Barron, J., '38	R.C.A.F.
Bald, J. D., '42	R.C.A.F.
Barlow, J. S., '42	R.C.A.F.
Beach, M. F., '42	R.C.A.F.
Bluhm, R. J., '42	
Bagg, G. R., '39	R.C.A.F.
Blaney, J. E., '27	R.C.A.F.
Busch, L. V., '42	R.C.A.F.
Bates, J. M., '22	R.C.A.F.
Brotherhood, R. W., '34	R.C.N.V.R.
Beckett, S. G., '41	R.C.E.
Brown, R. M., '42	R.C.C.S.
Browne, L. M., '25	R.C.E.
Bolton, W. W., '42	R.C.E.
Bellinghurst, R. G., '40	R.C.A.F.
Bayle, G. E., '34	U.S. Army Air Corps
Bruce, G. R., '38	R.C.E.
Belfry, W. G., '40	
Bannister, C. E., '34	R.C.C.S.
Brown, L. R., '34	R.C.A.F.
Brundrit, W. F., '42	R.C.E.



Roll of Service



Bennett, W. E., '23	R.C.E.
Bailey, R. P., '33	R.C.N.V.R.
Coppel, G. E., '41	R.C.A.F.
Crowe, J. F., '39	
Clemento, J. R., '38	R.C.A.F.
Cockshutt, C. F., '23	R.C.O.C.
Campbel, W. M., '28	R.C.O.C.
Cavell, W. E., '40	R.C.O.C.
Christian, J. D., '37	R.C.E.
Coupland, J. C., '40	
Cowie, W. E., '33	R.C.A.F.
Campbell, T. L., '23	R.C.A.F.
Connors, W.M., '24	R.C.A.F.
Coy, W. B. A., '39	R.C.N.V.R.
Chapman, F. M., '41	R.C.A.F.
Child, J. H., '41	Perth Regiment
Crawford, R. C., '35	R.C.E.
Church, B. G., '37	R.C.A.F.
Carriere, M. F., '37	R.C.O.C.
Couttes, C. C., '35	R.C.A.
Carr, J. A., '41	R.C.A.F.
Cramb, D. G., '42	R.C.O.C.
Cooke, F. G., '39	R.C.A.F.
Clifford, E. A., '40	R.C.A.F.
Cramp, C. A., '23	R.C.A.F.
Crase, G. H., '42	R.C.E.
Callan, T. P. J., '40	R.C.A.F.
Coughlin, J. D., '42	
Cooper, M.A., '35	R.C.A.F.
Code, R. G., '42	R.C.C.S.
Crawford, W. B., '42	R.C.C.S.
Culotta, F. P., '41	Queen's York Rangers
Cooke, W. N., '35	R.C.O.C.
Clive, J. C., '40	R.C.A.F.
Campbell, C. J., '36	R.C.N.V.R.
Corbett, B. S., '37	R.C.A.F.
Charters, H. B., '37	
Campbel, C. B., '38	R.C.N.V.R.
Clark, R. L., '37	R.C.A.F.
Clark, J. C., '39	R.C.A.F.
Carrington, J. W., '34	R.C.N.V.R.
Dworkin, D., '42	R.C.E.
Drummond, A. S., '35	U.S. Army
Deshner, W. J. H., '41	R.C.A.F.
Dick, C. D. R., '39	R.C.A.F.

Roll of Service

Douglass, A. K., '40	R.C.E.
Ewens, W. E., '36	R.C.E.
Etkin, B., '41	R.C.A.F.
Finlayson, D. G., '42	R.C.N.V.R.
Fowlie, J. A., '41	R.C.C.S.
Forestel, R. S., '42	R.C.A.F.
Ferguson, J. M., '40	R.C.A.F.
Fortier, R. J., '42	
Fergus, A. W., '40	R.C.O.C.
Fairlie, J. F., '34	R.C.A.
Furer, S. Y., '34	R.C.E.
Freestone, H. A., '37	R.C.A.F.
Ford, J. F., '39	R.C.E.
Fugler, R. W., '41	
Gale, R. M., '42	R.C.C.S.
Gundy, J. R., '42	R.C.E.
Gibbs, C. K., '38	R.C.A.F.
Gerhart, T. L., '42	R.C.C.S.
Griffin, R. S. G., '37	
Gilbert, K. Mc., '42	R.C.N.V.R.
Galway, R. H., '39	R.C.E.
Gordon, M. B. K., '26	C.A.T.C.
Gartshore, J. L., '36	R.C.A.F.
Howard, F. H., '40	R.C.O.C.
Hastings, I. C., '42	R.C.O.C.
Hendricks, E. F., '42	R.C.O.C.
Hill, A. J., '26	R.C.A.F.
Hulton, F. S., '36	R.C.E.
Hagg, N., '38	R.C.E.
Hersman, J. C., '39	
Horning, L. R., '42	R.C.N.V.R.
Henderson, W. J., '43	C.O.C.
Hillery, R. H., '31	R.C.N.V.R.
Hughson, J. T., '40	R.C.E.
Hoffman, W. R., '41	R.C.N.V.R.
Ingram, A. C., '42	R.C.O.C.
Johnston, N. F., '23	C.A.C.
Jenkins, R. C. H., '30	Scott's Fusiliers of Canada
Keefer, N. G., '14	R.C.E.
Kingsmill, H. A. G., '41	R.C.O.C.
Kelman, J. A., '26	
Kirby, H. S., '14	R.A.F.
Kilpatrick, M. A., '42	R.C.C.S.
Kerr, J. W., '37	R.C.A.F.
Kidd, K. H., '42	
Lee, J. W., '41	R.C.A.F.



Roll of Service



Leitch, J. M., '42	R.C.E.
Lilburn, J. S., '42	R.C.E.
Lyle, F. J., '23	R.C.O.C.
Lanning, J., '12	R.C.A.F.
Linton, R. E., '41	
Ledgett, F. D., '40	R.C.N.V.R.
Margison, J. E., '42	R.C.N.V.R.
Mitchell, C. M., '40	R.C.C.S.
Moore, W. B., '42	R.C.O.C.
Maynard, M. R. J., '42	R.C.N.V.R.
Millar, R. H., '36	U.S. Army Engineers
Munroe, F. B., '41	R.C.O.C.
Margesson, R. D., '38	R.C.A.F.
McBride, J. M., '33	R.C.A.F.
McQuarrie, J. L., '41	R.C.A.F.
McDonald, C. J., '30	R.C.A.F.
McLaughlin, G. J., '42	
McCallum, I. A., '42	R.C.O.C.
McLachlin, A. M. L., '42	
McCall, B. I., '36	R.C.O.C.
MacCleod, J. M., '40	R.C.O.C.
McCallum, W. D., '32	R.C.A.F.
McLaren, D. J., '38	R.C.A.F.
MacLean, W. D., '40	R.C.O.C.
Mitchell, T. H., '38	R.C.E.
Miller, N. E., '42	R.C.E.
Maunder, W. F., '21	U.S. Army
McKichan, J. D., '36	R.C.E.
McAdam, A. B., '40	R.C.E.
Newton, J. U., '39	R.C.A.F.
Prideaux, N. T., '42	R.C.E.
Powell, W. H., '39	
Pickett, F. B., '36	R.C.O.C.
Paul, R. B., '42	R.C.O.C.
Patterson, L. A., '4-	R.C.N.V.R.
Rupert, L. G., '42	R.C.O.C.
Richardson, W. A., '12	R.C.A.
Rule, R. A., '39	R.C.E.
Rogers, J. P. D., '42	R.C.N.V.R.
Rutter, W. E., '31	R.C.N.V.R.
Russel, B. H., '32	R.C.A.F.
Rudd, H. E., '40	R.C.E.
Rogers, J. H., '39	R.C.A.F.
Robinson, H. M., '39	R.C.O.C.
Roso, J. L. S., '40	R.C.E.
Sargent, W. T., '42	R.C.E.

Roll of Service

Scarlett, W. J., '42	R.C.N.V.R.
Sparks, J. D., '42	R.C.N.V.R.
Staples, H. E., '42	R.C.E.
Stothart, A. B. C., '36	R.C.N.V.R.
Spall, S. J., '35	R.C.E.
Sheepe, E. A., '40	R.C.C.S.
Smith, J. J. F., '39	R.C.E.
Siddall, K. C., '24	R.C.O.C.
Smith, W. N., '42	R.C.N.V.R.
Sloane, I. H., '42	R.C.E.
Stanners, L. N., '42	R.C.O.C.
Shearer, C. W., '42	R.C.N.V.R.
Soucy, C. I., '26	R.C.A.F.
Sheppard, H. L., '34	R.C.N.V.R.
Smith, J. O. S., '40	R.C.A.
Troster, J. M., '37	Infantry M.G.
Tamblyn, R. T. M., '42	R.C.E.
Thomson, W. A., '27	R.C.C.S.
Verity, T. W., '37	R.C.A.F.
Tregaskes, H. A., '34	R.C.E.
Thompson, W. D., '31	R.C.N.V.R.
Timms, R. H., '42	R.C.N.V.R.
Vacher, C. H., '39	R.C.N.V.R.
Vela, J. W. S., '36	R.C.N.V.R.
Vegars, E. A., '31	R.C.C.S.
Veal, W. W., '40	U.S. Army Air Corps
Woods, F. M., '42	R.C.E.
Wainber, H. S., '40	R.C.E.
Wilson, E., '41	R.C.O.C.
Warner, G. R., '42	R.C.E.
Wightman, H. H., '40	R.C.A.F.
Walkom, L. K., '32	R.C.A.F.
Watson, T. R. B., '40	R.C.E.
Watts, J. B., '41	R.C.A.F.
Wilson, R. T., '39	R.C.E.
Wilson, H. L., '41	R.C.N.V.R.
Wood, J. E. R., '30	
Wallace, W. J., '42	R.C.N.V.R.
Werry, J. McA., '39	R.C.A.F.
Wickett, J. A., '39	R.C.A.F.
Wilson, E. B., '40	R.C.A.
Wilson, G. W., '33	R.C.O.C.
Wooldridge, N. A., '39	R.C.N.V.R.
Westheuser, R. G., '35	R.C.E.
Willis, R. O., '31	R.C.O.C.
Zachanko, V., '36	R.C.A.F.





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UNIVERSITY OF TORONTO

1942-1943

*Revised
Edition*

TRANSACTIONS AND YEAR BOOK

of the

University of Toronto Engineering Society

No. 56

MAY, 1943

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EDITORIAL

“THE TIME has come the Walrus said, to speak of many many things - - -”. However we do not presume to burden you with a lengthy recapitulation of the year 1942-43. Instead we take pleasure in presenting the 1943 edition of *Transactions and Year Book*.

The sequence of material has stood the test of time, and so you will find that this year's *Transactions* follows the set up of past years.

We have attempted to include as much material as possible in this issue, but due to space and time available many worthy articles have of necessity been omitted. For this fact we beg forgiveness—especially from some of our deserving athletic teams.

The departure, for the O.T.C. at Brockville of the Editor-in-chief, in February may in part account for the lack of complet-

ness of the 1943 *Transactions*. We promise to do better next year.

The most noticeable feature of the past year has been the increasingly subdued activities both social and otherwise, due to a war-time period. But as we notice the ever growing length of the Roll of Service, and I regret that the list of those who have paid the supreme sacrifice is also growing, we cannot and do not gaze longingly on the pre-war days at School. The way in which our leaders and committees have re-designed all of our activities is something for which we engineers can well be proud.

The appearance of *Transactions* for many will herald the achievement of a goal which they set four years ago. For them we wish all success, but we would like to leave one short word with the men of 4T3 and indeed for those who will shortly follow.

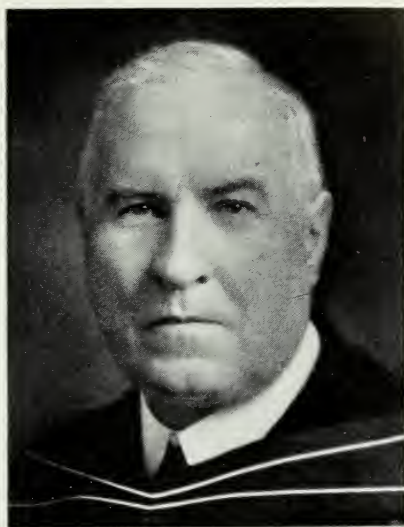
Has it ever occurred to you why, in an orchestra there are, let us say twelve violins? Why could not the sound of one of them be amplified by some means so that the effect would be the same? The answer you say is obvious—but why? The music produced by each individual player is different in quality and tone, even in a perfectly drilled band. The combined effort of many minds and many arms produces a result which cannot be achieved by one. In this simple but often unrecognized fact lies the secret of our democracy.

Let us bear in mind that if we are to live in a world of peace and harmony it is the combined effort, which must be a little different from what any one of us might prefer, is the first lesson every member of a democracy must learn. And as you look on this issue of *Transactions* let it remind you that there are many of your fellow Schoolmen both present and future who are willing and eager to help build a better world and a humbler one.

“Let knowledge grow from more to more,
But more of reverence in us dwell;
That mind and soul according well,
May make one music as before,
But vaster”.

H. W. PETERSON.

A MESSAGE FROM THE PRESIDENT



Another academic year amid the perils and pressures of war is drawing to a close. It has been a very strenuous year, with its combination of engineering studies and military training. The Dean has admirably fulfilled the duties of his high office as President of the Engineering Institute of Canada, as well as his heavy duties as Dean of a Faculty whose enrolment has reached a new high record. The call of the Government for engineers to serve in every branch of the Armed Forces and in industry has been promptly answered by an increased number of engineering students. In the No. 1 Army Course—a composite course of mathematics and physics and certain engineering subjects—first year men will be fitted in a year to hold technical positions in the Army. If such a course is continued next year, as it seems likely it will continue, many who would naturally enter the first year of the regular engineering course, will enroll in this No. 2 Army course. They will be technically-trained men, not fully trained engineers; but they will be on the way to become engineers.

The various departments of engineering have been kept in close touch with the industries, through various advisory committees of graduates. I cannot fail to pay a tribute of affectionate respect to one graduate who was Chairman of the Educational

Committee of the Alumni, the late H. E. Wingfield (affectionately and universally known as "Pat"), and who, both as an alumnus and as President of the Engineering Alumni, took the deepest interest in all Educational advances and experiments in the "School" and in the inter-relations of the University and Industry. A man of singular winsomeness, modesty and energy, his loss will be keenly felt. He was an ideal type of graduate.

In this war, the engineer is coming fully into his inheritance of responsibility and opportunity. It is a war largely of applied science. To win it the trained engineer is indispensable; never was he in greater demand. His training in accuracy, in adaptability, in practical power of doing things that ought to be done and in preventing things that ought not to be done, give him a wide field of service.

After the war, the engineer will have his part in helping human beings throughout the world back to a reasonable human existence, back to ordered freedom. Brains, courage, endurance and sacrifice will win the war and win the peace. Your profession will give an outlet to the spirit of adventure in man; you will have your great adventures in the search for truth and in the conquest of nature; in winning victories over famine, flood, pestilence and draught; in leading humanity into happier, richer, finer lives; and in the material and moral development of your country.

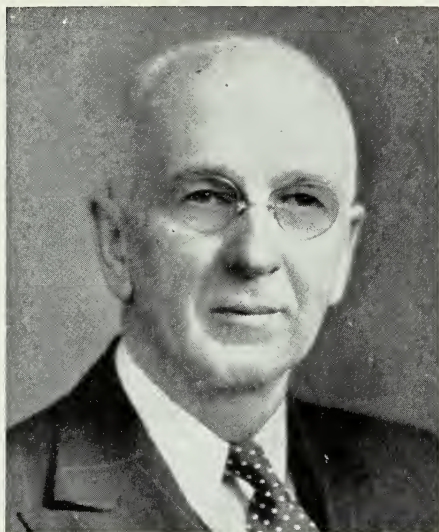
Sir Louis Beale, the famous British engineer, now on this side of the Atlantic, recently said to a group of American engineers: "The war has taught us that a mere mechanized world is a hollow dream. We know it is man that matters. We are bound to use machines to assist him, even in the destruction of his fellow-creatures; but we have learned quite definitely that man must remain the master—the machine must be his servant". This is a true comment on our age. Man is and must be more than the machine. Therefore every enrichment of your personality will make you a finer engineer. Kipling well expresses this outcome of noble character:

"Keep ye the law—be swift in all obedience—
Clear the land of evil, drive the road and bridge the ford.
Make ye sure to each his own, that he reap what he hath sown.
By the peace among our people, let men know we serve the lord".

My best wishes for your success in seizing and using the innumerable opportunities that now challenge you.

H. J. CODY,
President.

RETROSPECT AND PROSPECT



Once again the Engineering Society of the University of Toronto is to be congratulated on a successful and important year of work. It ought to be a source of considerable satisfaction, and I am sure it is, for students of this Faculty to realize that their own Engineering Society is the oldest Canadian engineering society with a continuous existence, having been organized in 1885. The Engineering Institute of Canada followed two years later. Another justifiable source of pride is in the efficient and highly competent way in which the officers of the Society manage its affairs. So well has this been carried on and so helpful have the activities of the Society been to the Faculty that every member of the staff recognizes it as a valuable instrument for the instruction and development of students of engineering.

Engineering societies, as such, are in English-speaking countries not particularly ancient. The earliest of them was established in 1771 under the general patronage of John Smeaton, the first practitioner to whom was applied the term "civil engineer", which meant non-military engineer. In a somewhat modified form it continues until the present day, carrying the title of the Smeatonian Society of Civil Engineers. It is now, however, merely a select dining club and its membership is not and never has been restricted to engineers solely. Useful though it may

have been, the Society is narrowly selective and only the senior and highly eminent have been eligible for membership.

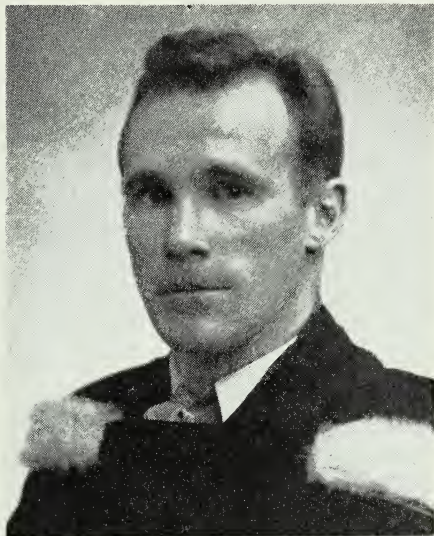
It remained for the Institution of Civil Engineers of Great Britain, founded in 1818, to provide, under the distinguished leadership of its first President, Thomas Telford, that opportunity for meeting and discussion so necessary for the broader training and development of young engineers. Not without a great deal of personal work and influence on the part of Telford did the Society reach its outstanding eminence as largely due to the encouragement given to young men to take part in its deliberations, not only for their personal improvement, but for the general welfare of the profession.

The motif around which the Institution of Civil Engineers built up its great prestige is a rallying point for all of the modern progressive engineering societies. They well realize that the honour and standing of the profession is in the keeping of its younger members. Anything that contributes to their capacity and attainments as broadly-educated and resourceful professional men will be to the general advantage of all engineers, and to that of the country as a whole. And so, unusual emphasis is being placed upon the post-graduation training and development of the younger men of the profession. That is a vital plank in the platform of the Engineers' Council for Professional Development, of which the Engineering Institute of Canada is a constituent member.

In the years that lie immediately ahead there will be many opportunities for young men who have graduated, or who have had some instruction in engineering, not only to test their own mettle but to demonstrate to others their probable effectiveness in the professional field. The first lift of the foundation upon which the success of their careers as engineers will depend is that of technical competency. It is therefore essential to acquire a sound knowledge of the scientific principles underlying the practice of engineering and to observe how that practice makes use of them. But over and above that, every young engineer who hopes to travel far and to accomplish much must keep constantly before him the ideal of his calling as that in which any ambitious and public-spirited young man might with pride endeavour to achieve eminence.

DEAN C. R. YOUNG.

THE PRESIDENT'S MESSAGE



*"For tho' my lips may breathe adieu
I cannot think the thing farewell".*

Again has come a cross-road. We have travelled a long, laborious highway of instruction and guidance. To some it is the end of a chapter, to other a paragraph from the book of "Life". Be that as it may we have a common memory from this book.

To all, the word "School" and its close associate "The Engineering Society", bring out the cord that binds an inexhaustible sea of good spirit.

Schoolmen may well be proud of their organization. Its success has been due to the whole-hearted co-operative spirit of the undergraduates. To those undergraduates who shall return next year I say, "you have a record of accomplishment to live up to. The future looks to you to add to the spirit of School".

Your executive this year has worked hard and special credit is due to the club chairmen who have handled the "new order", due to compulsory club fees, in a most efficient manner.

For a number of reasons the First Vice-President "Ack"

Aykroyd has had a most difficult year. The obstacles to be overcome were due to the pressure of the times. Yet we must admit that the school functions this year were equal to, if they did not surpass, anything we have had for some time.

Jack Abell who took over the store last fall on short notice has performed an excellent service for the undergraduates. To those who watch the pocket book it needs no explanation. In the face of rising costs Jack has manipulated prices so that substantial reductions were possible on a number of items.

Two of the more quiet members of the Engineering Society Executive are Julian Dravis and "Buzz" Crosby. They had little to perform that is spectacular but much of their time was taken up either with correspondence or keeping our deposits and accounts in good order.

The publicity department under the capable hand of Bill Moser has kept the undergraduates informed. The censor bureau as set up under the publication director is new. I should like to compliment "Moe" on a delicate task well done.

The year presidents have left their incoming executives a high standard of achievement.

To those who come after and take up the gavel of authority we extend our every wish for success.

And so—

Tho' this may seem the end to some,
As heart may well be chilled and numb,
We step aside as friends will do
To lift the glass and breathe adieu.

JIM CAWLEY.

Transactions

1943

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Engineering Society

THE UNIVERSITY OF TORONTO

ENGINEERING SOCIETY NOTES

October 6th—

The first Engineering Society meeting was opened with an interesting address by Mr. A. E. Byrne of the Canadian General Electric Company. A capacity crowd enjoyed an illustrated discussion on "Plastics".

November 2nd—

A debate between Victoria College and School was featured at this meeting. The subject before the house was: Resolved: "That an Arts man is more valuable to society than an engineer."

November 19th—

Mr. T. H. Millar of the Eastman Kodak Company, Rochester, spoke on "Popular Photography", illustrating his discussion with technicolor films.

December 1st—

The speaker on this occasion was Mr. Otto Holden of the Ontario Hydro-Electric Power Commission. Mr. Holden discussed the Commission's "Desew Power Development", showing slides of the project at different stages during its construction.

January 11th—

Mr. P. H. Take of the Canadian General Electric Company. With the aid of slides and motion pictures in colour. Mr. Take's subject, "Win the War With Welding", was particularly well received by the second year students.

January 21st—

This was the occasion of a joint meeting of the Engineering Institute of Canada and the Engineering Society. It was the annual students' night of the Engineering Institute at which members of the Engineering Society presented papers.

January 26th—

The guest on this occasion was Mr. Beattie of Anaconda Copper and Brass Company, who presented motion pictures on "Copper at War".

February 15th—

The Bell Telephone Company's Mr. Geiger was the speaker. His address on the Nature of Speech and Music illustrated with slides and sound was of a very practical nature and was particularly well received by the electrical and engineering physicist undergraduates.

THE PLACE OF ECONOMICS IN THE CURRICULUM OF AN ENGINEERING SCHOOL

By V. W. BLADEN, M.A., (Ox.)

It is no doubt, unwise for a member of the Faculty of Arts to discuss the curriculum of the Faculty of Engineering, especially uninvited. But I have been interested for over a decade in promoting co-operation between the School of Commerce and the School of Engineering, and that interest has been greatly intensified by the generous response of the second year engineering students, last year and this, to my efforts to give them an introduction to economics. I have been further encouraged to offer some remarks on this subject by reading an excellent article by Professor Tucker, of the Massachusetts Institute of Technology, in the *Journal of Engineering Education* (June, 1942) on "Fitting Economics into the Thinking of the Undergraduate Engineer". I would like to circulate this article amongst the staff, students and graduates of the Faculty. Instead I quote a key paragraph which may serve as my text.

If abilities are contrasted with interests, the typical budding engineer has abilities that would make him a good president, or general manager, but he has frequently the interests that tend to make him a good foreman or division superintendent. The very difficulty of engineering subjects tends to strengthen this absorption in the narrowly technical aspects of production. An undergraduate in some liberal arts college, on the other hand, may have only the ability necessary to become a good foreman, but he may have interests and a view point that might lead him eventually to the president's chair."

This quotation leads me first to state my belief that the distinction between the liberal and the professional faculties is unreal. Many of the students of the Faculty of Arts are taking essentially a professional course, and the courses in Applied Science can be liberalizing. That is mainly a matter of the way subjects are taught. I say this by way of preface to some remarks on the professional importance of training engineering students in economics, or rather in political economy in its widest sense. I shall say little about the important part the course in economics may play in awakening students "to the existence of business as an institution that includes far more than production," though this Professor Tucker believes to be a most necessary function. Engineering students, he suggests, "are aware of the existence of about 9 per cent of the problems of managing a manufacturing enterprise." I would emphasize one point only, namely that engineers must be able to

handle men as well as machines and their education must provide some understanding of human nature, and of social, political and economic history, would help to develop a sense of the inevitability of social change and the impossibility of changing social institutions to suit ones own convenience or to conform to one's own standards of reasonableness. Work in economics should give some sense of the manifold repercussions of any business act, and some appreciation of the public interest in every private act. Work in political science should give the engineering student some understanding of the political difficulty of achieving what may be desirable from an economic and engineering point of view. The value of sociology for the engineer has been amply demonstrated by the work of Professor Elton Mayo in the General Electric Company; closely related to this is work in industrial psychology. But all of this requires more than 1½ hours a week in the second year! I suggest that there is a very good case for two hours a week of social science in each of the second, third and fourth years. A scrutiny of the calendars of the great American engineering schools would indicate that this is a modest suggestion. Such a change in the curriculum might help to make engineering students realize the real significance of the words of Henry A. Wallace quoted in the Dean's Message in last year's *Transactions*: "There is such a thing as life, and the mathematics of life is as far beyond the calculus as the calculus is beyond arithmetic."

Besides suggesting an increase in the time devoted to the social sciences in the strictly engineering course, on the ground that it would contribute to making the graduate better professional engineers, I want to suggest that the time has come to explore the possibility of a joint course in engineering and commerce. There is, I believe, a great need for men in business who know enough about engineering to be able to appreciate engineering advice. There will be a growing need for men of this sort as manufacturing industry expands in this country after the war; the scarcity of such men now is probably one of the serious bottlenecks in our war economy. Perhaps two types are required, men who major in engineering but do commerce as a minor, and men who major in commerce and do engineering as a minor. In the past plans for such cooperation have been discussed, but nothing has come of them. I believe something should be done soon, and I remember that the course in Commerce and Finance was established in response to the demand of prospective students and prospective employers of its graduates. I hope that this brief note may stimulate a demand for a course in Commerce and Engineering.

- V. W. BLADON.

SOLID FUELS FOR INTERNAL COMBUSTION ENGINES

*Prize-Winning Paper given by J. M. Dyke, IV Year Mechanical to
Engineering Institute of Canada, Internal Combustion.*

The following is a brief description of an Internal Combustion engine which I believe offers a long range solution to our present fuel problem that has been brought so forcibly before us these past months.

This fuel shortage will become more acute after the war as our rate of fuel consumption increases and as we deplete our oil supplies. We have learned how much we rely on the Internal Combustion engine for many of our luxuries and some of our commercial uses and a search for a new type of engine is necessary and will be commercially possible as the price of fuel rises owing to its scarcity.

In 1892, Rudolph Diesel proposed a hypothetical Internal Combustion engine which would run on any type of fuel. Amongst those proposed was powdered coal. The air in the cylinder was to be compressed to such a pressure and temperature that the coal would ignite spontaneously, burn and produce work. However, his attempts failed and he turned to the less difficult task of atomizing liquid fuels and completed the first successful Diesel engine in 1897.

In recent years many attempts have been made to put Diesel's original idea into effect, that is to develop a commercial coal dust engine. The most notable of these and the ones which have obtained the best results are those built by Rudolph Pawlikowski, a former assistant of Diesel, who began his work in 1911, and after five years of exhaustive research produced reliable running results.

Coal presents the most likely source of pulverized fuel as it is our most abundant source of available heat energy, and reserves are estimated to be good for many centuries. Other fuels can be used with success and especially good results are obtained with fuels having a high oxygen content, which gives a high Mean Effective Pressure without supercharging. Some of the fuels that have been used are coal, coke, saw dust, ground olives, rice—in fact anything that will burn can be used provided the requisite changes are made in the engine.

The choice of any of these fuels depends on its availability.

For example, an industrial plant during processing may produce an explosive dust. To prevent the hazard of a dust explosion the particles have to be collected and removed. The removal involves expensive equipment and the disposal of the dust may be throwing away a source of cheap fuel for a prime mover. Here it is possible to design an engine to run on this dust and so an otherwise waste becomes a valuable by-product.

It will be noted that the development of the Internal Combustion engine went hand in hand with the development of fuels. That is, as better fuels were refined, engines were built to utilize the advantages of these fuels.

The gasoline engine is a good example of this, as higher octane fuels were made, engines were built with higher compression ratios which resulted in higher thermal efficiencies and thus better engines.

So it seems probable that as the methods of refining coal for use as a fuel progresses it may be commercially possible to use it as a fuel for Internal Combustion engines. Possibly progress along these lines has been slow because coal is so readily usable in its raw state, thus the urge to improve its qualities by removing foreign material has lagged.

A further advantage of using coal in an Internal Combustion engine in a power plant is that, theoretically at least, the overall plant efficiency is greater than that of a steam driven unit. In the latter the heat energy of the coal is transferred to the working fluid, steam, which carries the heat to the cylinder where work is done, and the overall plant efficiency is the product of the boiler efficiency and the prime mover efficiency.

In the powder coal engine plant the heat energy is employed directly in the working cylinder without heat transfer losses through boiler heating surfaces and the same maximum temperature limitations, thus the overall efficiency is that of the engine alone.

It is well known that dust explosions occur and to harness such power would be a new source of fuel. The nature of these explosions is now generally considered to be similar to gas explosions. Dust requires definite ignition temperatures, have upper and lower limits of concentration and may be ignited by any source which will ignite gases.

The ignition of the mixture of air and dust results in a primary flash or explosion of limited proportions. The propagation of this flash, through a finely and uniformly divided dust

cloud, travelling at high speed builds up considerable pressure which raises the whole charge to its ignition temperature, and complete combustion results.

From this brief analysis of a dust explosion, it can be seen that in using a pulverized fuel means must be employed for:—

1. Injecting the fuel in a finely divided dust cloud.
2. Raising the mixture to its ignition temperature.
3. Supplying the necessary oxygen.

The first is the most difficult; the second requires only the correct compression ratio to raise the contents of the cylinder to the correct temperature; the third supplying the oxygen requires the correct design of combustion spaces and the proper mixing of the fuel and air before and after ignition.

In selecting a system of injection we turn to the best proven method now in use, which in the case of the oil engine is solid ignition. This system avoids the use of air compressors which are required by the alternative injection air method. The use of compressors results in a lower mechanical efficiency and an increase in size, weight and initial cost of the unit. But owing to the inherent differences between liquids which are incompressible and dust particles which have no resemblance to the action of a closed fluid system we must turn to air injection which seems without doubt the most practical way of transporting the pulverized fuel.

This system has these advantages:

1. The complete flotation of all dust particles which is essential for good and complete combustion.
2. Supercharging of the cylinder which increases the specific power of the engine.
3. Because of supercharging a two-cycle engine could be used which results in less moving parts. This is important due to the complication of the mechanism necessary for the preparation and injection of the fuel.

In its present stage of development the pulverized fuel engine by no means replaces the gasoline or heavy oil engine nor will it until many improvements are made. At present it has a limited field of application and lends itself to large installations running at low speeds.

As the need for a substitute for oil and gasoline increases so will the use of dust engines and as the use increases, improvements will be made to make this a more efficient and adaptable Internal Combustion engine.

NOTES ON APPRECIATION OF MEDICALS

BY I. W. SMITH

Few people really enjoy a medical examination, which seems unfortunate at a time when the opportunities are so plentiful. Of course, ANY examination will lack interest if it covers unfamiliar ground. (Perhaps the reader will recall examples of this type.) Hence this paper has been prepared to correct a long neglected deficiency, for although there have been articles on how to set the speedometer back and paint the tires to look like new, very little has been said on how to boost a sagging blood pressure, or vice versa, how to look like a double hernia.

It is well known that one of the best ways for a jumper to clear a hurdle is to lower the hurdle to a convenient height. Similarly the medical examination can be made less rigorous by asking the examiner a few simple but intriguing questions. This method is successfully practised by my dentist. Just before commencing a filling operation he poses some innocent question such as "How deep should a gold reinforcing post be set to resist combined bending and direct load due to molaraction?" By the time I have produced a suitable formula I discover he had completed the JOB and is then in the process of pocket-book extraction.

With these points in mind, we shall proceed to examine the examination in detail. The first item on the program consists of complete and all-inclusive Disrobing of the Person. This has three advantages (to the examiner): (1) it renders the victim vulnerable and places him on the defensive. This is not good, for as anyone knows, victory cannot be won by defensive action alone; (2) like lifting the hood on a car, it improves the visibility. For example, it might otherwise be difficult to distinguish, via the stethoscope, between a loose valve in the heart and a case of induced lateral knee vibrations; (3) it prepares the examinee for Test No. 1, that of Weight-to Power ratio, which will be considered next.

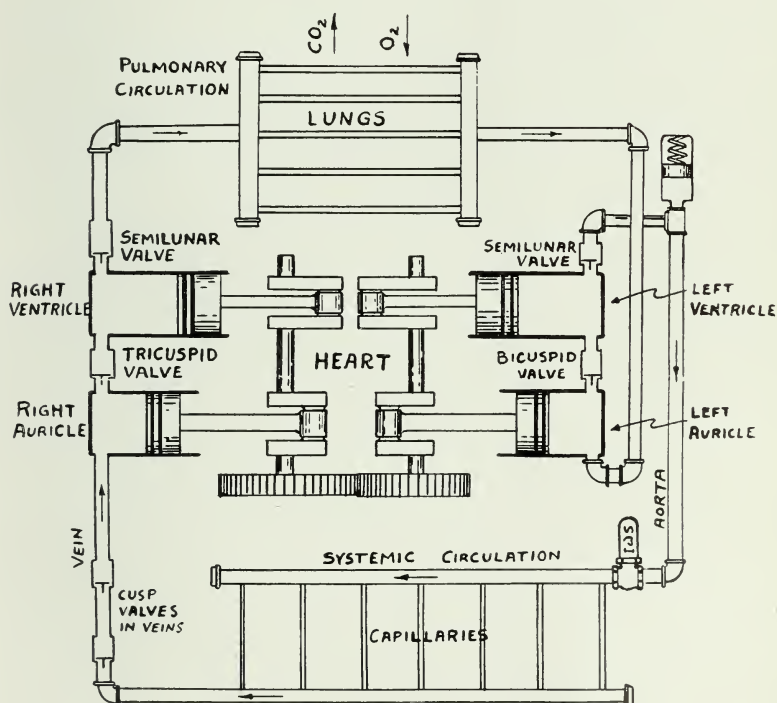
Just as the S.A.E. rating of nominal Brake Horse Power for

$$4 \text{ cycle engines is given by the empirical formula } B.H.P. = \frac{d^3 n}{2.5}$$

where d is the piston diameter and n the number of cylinders, no account being taken of mean effective pressure, speed, or other variables, so the Weight-to-Power ratio is obtained empirically from two measurements, namely weight in pounds and height in

inches. This determination does not consider the effects of Weight Distribution and therefore the victim should draw attention to the fact that his weight is concentrated mostly in muscles.

Having evaluated conditions externally, the M.D. proceeds to deduce from various observations on the outside the state of things internally. This guess-and-hope you're-right method is necessary since the Human Works were not made removable for inspection. Indeed, it is fortunate that such is the case, as otherwise non-medical persons such as engineers would likely tamper with their carburetor settings, etc.



The first measurement required is that of blood pressure, and a word or two might now be said concerning the human plumbing system. The flowing blood stream consists of plasma (of great value to your nearest Blood Donor Clinic) in which there red corpuscle freighters and white corpuscle fighters. The blood is kept flowing by a pair of two stage pumps (the heart), the low pressure cylinders being called auricles and the high pressure cylinders ventricles. The intake pipe is fitted with what might

be called foot valves, but are actually called cusps (from the Greek word "cuspidor" meaning to hold). Between the low and high pressure cylinders are placed the bicuspid and tricuspid valves, while at the high pressure outlets there are the semilunar valves. Between the two pumps there is a transfer section known as the lung circulation, in which carbon dioxide is unloaded from the red corpuscles and oxygen is reloaded.

The action of the heart is relatively automatic and will be carried on even in the absence of a brain (thus explaining why some people continue to live). In fact, pieces of the heart that have been completely removed from the body will continue to function some time before they discover what a dirty trick has been played on them.

Blood is carried from the heart in a large pipe known as the aorta, which, due to its elastic construction serves as a surge tank by expanding during each ventricular discharge. This surging of pressure in the arteries is known as the pulse. The blood eventually passes through a series of very small capillaries, where the pressure drops and the fluctuations disappear, and finds its way into the return pipes or veins.

Blood pressure is measured on a sphygmomanometer (pronounced as it is spelled) which, unlike the engineer's Bourdon gauge, cannot be screwed directly into the blood system. At first glance it seems as though the medico is going to pump out all the blood to measure its pressure for he wraps a suspicious looking black band around one's arm and connects it by tubing to a squeeze bulb, a container, and a vertical manometer tube. The victim restrains himself with difficulty from yelling "Dirty Meds", remembering in time that his retreat is not covered.

The principle of the sphygmomanometer is simple and usually harmless in operation. A pressure is developed in the arm band by means of the squeeze bulb, to a point where no pulsation can be detected in the lower part of the arm. The pressure is then released slowly, and the value indicated by the mercury manometer at the instant when the pulse reappears is known as the systolic pressure. This should be in the region of 110 to 120 millimeters on the manometer, or about 2.3 pounds per square inch, and represents the heart's maximum effort, less pipe friction losses up to the point of measurement.

The doctor detects the return of the pulse by placing his stethoscope at the victim's elbow but it is also noticeable on the falling mercury column for at this point it begins to "bounce". If this procedure is found to be interesting one might question

the examiner's reading and have him do it several times to get a correct value. Of course this shouldn't be prolonged too long, as gangrene might appear in the lower part of the arm.

In addition to taking the blood pressure the M.D. likes to listen to the heart through his stethoscope, for by analyzing the sounds he can determine such things as improperly seating valves, errors in timing, loose push rods, too much clearance in the tappets, etc. Incidentally this gives the victim an opportunity to test the examiner's skill by introducing extraneous sounds such as a deep burp or by tapping out some code on the teeth.

Testing of the blood system is followed by the Knock and Listen test used in prospecting for unusual or misplaced organs which are then located on the outside by a pattern of pen and ink crosses; the Reflex test, used to check the electrical circuits; the Eye, Ear and Subsidiaries test; Sampling of the Drains; and finally there is Filling out the Card. These will be discussed more fully in the next issue.

ELECTRONIC DEVICES

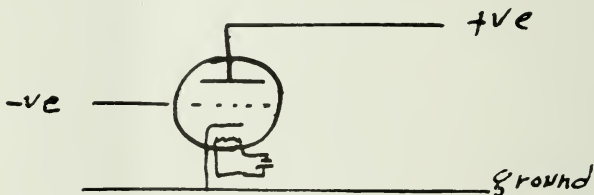
*Prize Winning Paper Given by R. E. Scott, IVth Year Eng. Phys.
to Engineering Institute of Canada.*

Up till the time of the last war the electron tube was a plaything in the hands of the scientists. During this period, however, it was developed to a remarkable extent, and was soon being used for communications in every phase of the battle. This development paved the way for the terrific expansion in the 1920's in the field of radio broadcasting. So common have radios become now, that it is difficult to realize that they are only 20 years old.

In the present conflict the progress is continuing. All our armies, fleets and air-forces depend on the electron tube for communication and directions in battle. It is the all seeing eye which warns of the approach of the enemy and by its aid the most complicated manoeuvres are carried out. And it plays its part in industry as well, controlling countless industrial processes and protecting the health of the worker as well.

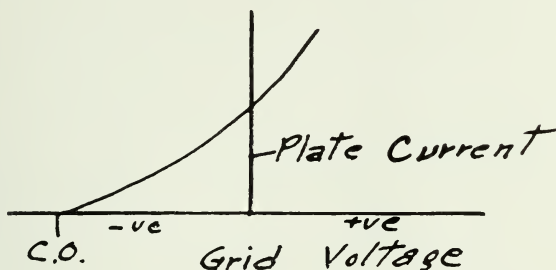
None of the advances which are being made in secret war devices will be lost. The problems of high frequency tubes and the elimination of static as well as problems relating to television have been solved in other connections and after the war the domestic users will reap the benefit. In addition to these there are other devices which will invade our lives with simply amazing results, and it is of these that I wish to speak.

The key to all these developments is a circuit called the multivibrator which will produce a pulse of current when it is excited by a small applied voltage. In order to explain its action it is necessary to review a small amount of electronics.

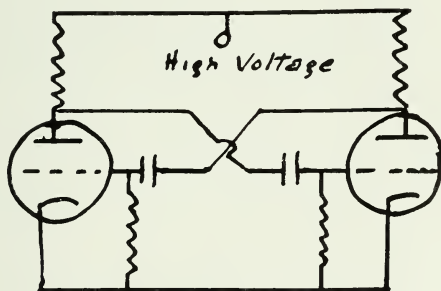


The electron tube is just an evacuated bulb like the old electric light bulbs. It contains a filament which is heated by an electric current and which then gives off electrons into the vacuum above it. These electrons are small negatively charged particles and if a positive potential is applied to the plate in the tube they will be drawn over to it and the equivalent of a current

will flow in the plate filament circuit. Another electrode is added in between these two in the form of a screen which lets the electrons through. Now if a negative potential is applied to this grid, as it is called, the electrons which are negative will be repelled away from it and not so many will flow to the plate. It is obvious that if the grid is made negative enough it will repel all the electrons and there will be no plate current.



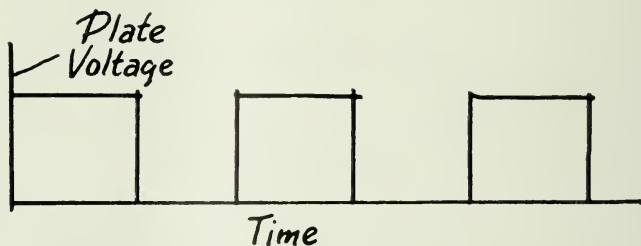
A graph is plotted of the plate current on the grid voltage and it is obvious that at a certain grid voltage called the cut-off the plate current ceases to flow. This is the fact which is needed for the subsequent discussion.



A diagram of the multivibrator circuit is given here. There are two tubes used and there are resistances in the plate circuits. Suppose now that a small negative pulse is applied to the grid of the first tube. This repels some of the electrons and causes a decrease in the current flowing in the plate circuit. This causes a decrease in the voltage across the resistor in the plate circuit and hence an increase in the voltage from the plate to the ground, since the supply is constant and these two voltages must add up to the voltage of the supply. This increase is applied to the grid of the next tube and its plate current is changed, thus producing again a voltage change which is applied back to the grid of the

first tube and which thus reinforces the original change. This process repeats and the grid gets more and more negative until it stops the flow of plate current. Nothing more happens for a moment until it starts to go positive and then the reverse cycle occurs and the other tube stops conducting.

When the tube is conducting there is a voltage across the resistor, but when there is no current flowing there is no voltage across the resistor and so if a plot of the voltage across the resistor for one of the tubes were made it would look like the following.



The ordinary multivibrator keeps making these square waves indefinitely but if the voltage of one of the grids is now made negative with a battery, no current can flow at all unless a positive pulse is applied to the grid to start it. Under these circumstances the device is called a Kipp Relay and it will produce a large pulse in the plate from the application of a small pulse in the grid.

These pulses can come from a photoelectric cell, a microphone, or another vacuum tube circuit. The output from the plate can be used to work relays or counters and the circuit can thus be used in a thousand ingenious devices.

Up until very recently all races have been timed by human hands operating stop-watches. The stop-watches used are very good and will often read to $1/100$ of a second, but unfortunately human reaction time is still around $1/5$ of a second and so the method is not very satisfactory. Various improvements have been tried in the past from having the runners carry magnets in their pockets to cut coils along their path with magnetic flux and so record their passage, to having wires broken at the beginning and the end of a race. A much superior method is provided by the multivibrator. A microphone is used to pick up the starting gun and it supplies a pulse to the grid of the tube in the above circuit which causes the device to produce a large pulse in the plate which will start a timer. The end of the race is recorded

when the winner crosses the finishing line, by having him break the light to a photo-electric cell. The voltage across the cell then goes up and pulse is applied to the grid of the multivibrator to stop the timer at exactly the right moment.

Another application which is of some interest at the present time concerns burglar alarms. The multivibrator provides a fool-proof method of protecting your tires from any marauder. A stream of infra-red light which is invisible to the eye is placed across the garage door and allowed to fall on a photo-electric cell. If any burglar so much as prowls around he will unwittingly cut off the light of the cell. This will cause its voltage to rise suddenly and a pulse will be applied to the multivibrator, which will produce a large voltage in the plate which will operate a relay which will ring a bell which will bring the police and the burglar will be caught.

A similar application which will revolutionize the highways of the future is quite possible. When a car passes one photo-electric cell, it produces a pulse which operates a relay which starts a timer. Then after an interval it passes another one and a second pulse is sent to the multivibrator. If the time interval between these two pulses is too short, that is, if the car was going too fast, the first relay will remain open and it can ring a bell to tell the driver he was going too fast, take a picture of his license plate for future reference, or it can be used at busy places just to count the number of cars that go too fast. In the future if you speed up too much on the highway you are likely to hear a microphonic raspberry warning you to slow down, or if you approach a blind corner in the dark too fast a loud voice from a microphone is liable to bellow a timely warning. The death toll on the highways of the future must go down!

A very similar device can be used in industry as well. Light is reflected into a photo-cell from a number of oranges sliding down a trough. If a bad one comes along, it will reflect less light and a pulse of voltage will be developed across the cell which will cause a multivibrator to operate and produce a large voltage surge which may be used to make an arm shoot out instantly and remove the offending specimen.

By placing a counter in the plate circuit the device may be used as well to count the number of entities sliding down an industrial line. An application similar to this is made by our cousins, the theoretical physisis to the counting of cosmic rays.

Cosmic rays are similar to the electromagnetic waves which carry our radio programs and of which light is composed. They

fall on the earth spasmodically and no one knows whence they come, although it is supposed that they are disintegration products of outer space.

If their secret could be discovered these cosmic rays would be a source of untold energy. They are investigated through their property of ionizing the air through which they pass. If a special type of gas filled tube is used with no grid and a high potential on the plate there will be a surge of current everytime a cosmic ray ionizes the air between the electrodes into its positive and negative parts. If this current passes through a resistor a voltage surge is produced which is large enough to operate the multivibrator. If a counter is now placed in the plate circuit the number of cosmic rays can be counted.

There is another application of the multivibrator that is not without some interest. It depends on the number of harmonics in its square wave output. This square wave can be shown to be made up of a number of sin. waves of various frequencies. (Theoretically an infinite number). The higher frequencies are present in the output and can be used to control the vibration of a quartz oscillator. These quartz oscillators have a natural frequency of their own and will oscillate with a constancy of one part in 10 million. They have applications to the frequency control of broadcasting stations. There are only 96 broadcast bands and crowded into them are over 1,000 stations. Each one must obviously stay within its own frequency limits.

As a sidelight on frequency control it is interesting to note that our only standard of time is the earth's rotation or some fraction of it. Up till now it has been assumed that this is constant as there was no way of checking it, but these very accurate crystal oscillators will provide a means of testing this. If the absolute acceleration of the earth were thus known interesting experiments to check the theory of relativity could be devised, which up till now has never been satisfactorily done.

Most engineers are, of course, interested in the powerful forces of nature, and their harnessing and control, than in the tiny insignificant electron. However, it is quite conceivable that a device which is almost human in its action may dwarf and outlast its more powerful neighbours, just as man has outlived the huge dinosaurs and other Mesozoic reptiles. Already we have had suggestions of its uses, and of the power it may some day unleash for the use of Man. Today the electron tube protects us from the squadron of the Hun, tomorrow it will invade our lives and usher in a new age, the Age of the Electron Tube.

SYNTHETIC RUBBER

Prize Winning Paper Given by W. E. A. Rispin

Rubber as we knew it until a few years ago when synthetics came to the fore, is a natural material, the product of a tree which takes twelve years to mature. For this reason rubber production cannot be rigidly controlled and hence the world supply of rubber is rarely equal to world demand. This produces fluctuations in the price of natural rubber and makes for economic instability of the rubber industry.

Again, as we have recently seen, imports of this essential raw material to European and North American markets, may be cut off by war, leaving many important industries stranded.

Finally, when we see that the establishment of a synthetic rubber in any given country would lead to its independence of world trade and economic conditions and would moreover help to alleviate unemployment, it does not seem strange that all the major powers, England, The United States, France, Germany, were engaged in a century-long race to develop the first practical synthetic rubber.

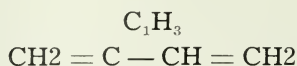
After the introduction of rubber to the commercial world, many attempts were made to exploit its unique resilient, elastic and waterproof properties but these were universally a failure because the untreated rubber became a sticky gum on a warm day or cracked on a cold one. One American rubber company went bankrupt when 20,000 pairs of its shoes melted during shipment to a New York store.

An American, Charles Goodyear, was greatly impressed by this mishap and began a long series of experiments to find some way to desensitize rubber to heat and cold. For a long time he had no success but finally, in 1839, he dropped a mixture of some latex (the sap of the rubber tree) to which he had added sulphur as a drying agent, on a hot stove. To his amazement, the mass hardened instead of becoming liquid as he had expected. He saw immediately that he had discovered a means of desensitizing rubber to heat and he called the process vulcanization.

As soon as it was seen that rubber could be treated so as to make it serviceable in a wide range of temperatures, many chemists began work to discover a cheaper substitute. At that

time they planned to duplicate rubber chemically and physically.

The first step in the synthesis of rubber was to get some information on the structure of the natural material. Rubber was unlike any material previously encountered by chemists and so the usual methods of analysis, crystallization, molecular weight, determinations by vapour density and so on were useless. For this reason the early workers resorted to destructive distillation to obtain some information about rubber's structure. Most of these workers obtained impure oils but finally, in 1860, Williams, an Englishman, isolated the parent hydrocarbon of natural rubber having the structural formula



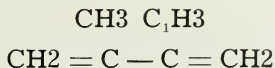
which he named isoprene. It was a colourless, mobile, low-boiling liquid.

Fifteen years later, Bouchardat was able to polymerize isoprene back to an inferior rubber in the presence of hydrogen chloride as a catalyst. This was of academic interest only since he had simply made synthetic rubber from the natural material. A few years later, however, Bouchardat was able to produce isoprene by the destructive distillation of turpentine, so that rubber could then be synthesized on a laboratory scale.

Work on rubber synthesis went on slowly until about 1910 when, as a result of labour and shipping difficulties the price of natural rubber went up to \$3.00 a pound. Three dollars will pay for the synthesis of a pound of a fairly complex organic chemical and a feverish search for a means of building up rubber began in England, France and Germany.

There were many important developments during this period. The English firm of Matthews and Strange patented the polymerization of higher alcohols from fusel oil in the presence of sodium as a catalyst. It was seen that the supply of fusel oil was too small to provide the amounts of amyl and butyl alcohols needed so Fernbach in collaboration with the Pasteur Institute in Paris developed a process for producing these alcohols by the fermentation of starch using a special yeast grain.

In Russia, Kondakoff and Ostromislenski, working at the sereach foundation in Moscow discovered a whole series of plastic materials known as the " ω polymers of Kondakoff" by polymerizing dimethyl butadiene



under certain conditions. Later they found that dimethyl butadiene could be polymerized in the presence of metallic catalysts especially sodium under heat and pressure to yield a soft, crude artificial rubber which they called methyl rubber. Their most important contribution was to show that the same material may be polymerized under different conditions to form different products.

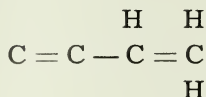
Probably the most important development in this period, however, was a change in the viewpoint of the rubber technologists. Previously they had been trying to duplicate the chemical structure of natural rubber and to produce this duplication at a cost lower than that of the natural material. As soon as they succeeded in making the most inferior synthetics they saw that although they did not have the same molecular structure or even the same formula as natural rubber yet they possessed certain properties such as resistance to ultra-violet light, oxidizing agents and organic solvents which made them more valuable. They now saw that their problem was to duplicate the physical structure rather than the chemical structure of rubber and that the cost of the new product was relatively unimportant.

From this time progress in rubber research accelerated rapidly. In 1915, Germany deprived by the British blockade of her natural rubber supply began the production of methyl rubber. About 2,000 tons of this substitute were made at a factory in Emden. It proved unsatisfactory for tires, however, because it was so soft and immediately after the war the Germans went back to the use of natural rubber in manufactured articles. However, research was continued on the synthetic problem although little progress was made for some time.

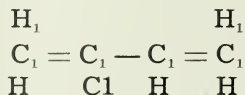
Meanwhile, research led by Dupont had been going on in the United States. Little progress was made for some time. However, about 1926, a group of Dupont research chemists attended a meeting of the American Chemical Society at which one of the speakers was Dr. Jules Niewland, a professor of chemistry at Notre Dame University who had devoted his life to a study of acetylene and some of its derivatives. Bolton, head of the Dupont group working on rubber research was impressed by Niewland's discoveries secured patents on them and turned them over to a group headed by Carothers for study. Using Niewland's work as a starting point Dupont's patented a rubber-

like polymer which they named duprene, now known as neoprene, the first really satisfactory synthetic ever produced.

The starting point in the manufacture of neoprene is to pass purified acetylene into an aqueous solution consisting of 20% cuprous chloride and 80% ammonium chloride. This results in the formation of vinyl acetylene and small quantities of divinyl



acetylene. These two are separated by fractional distillation and the vinyl acetylene treated with HCl to form chloroprene, a colourless, low-boiling liquid having the structural formula

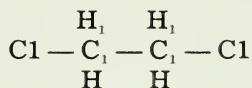


which is the parent monomer of neoprene. The next step is to polymerize or link up together the molecules of chloroprene to form a long molecule of rubberlike neoprene. This is usually carried out by the emulsion method. The chloroprene is emulsified with water using soap as a wetting agent. The emulsion is kept at about 70° F. under ordinary pressure for about 15 hours. At the end of this time it is a thin white liquid physically much like natural latex. This latex is coagulated by the addition of Acetic acid. The coagulum which rises to the top is skimmed off, washed, milled massed and dried much as is natural rubber. An interesting feature of the processing of neoprene is that no vulcanizing agent is needed. The substance is vulcanized merely by heating it gently.

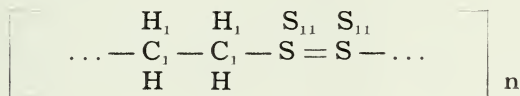
Neoprene has many valuable properties, among the most important being resistance to the corrosive action of organic solvents such as benzene, naphthalene, gasoline and also vegetable oils and resistance to oxidizing agents. In addition it will not burn readily and so is used as an insulating material for electric wires. It has good resistance to abrasion and so is being used in tires. It is not aged rapidly by exposure to ultra-violet light as is natural rubber so it is used in the exposed rubber parts of airplanes which are often in strong sunlight above the clouds. Finally it is about 40% chlorine by weight. Chlorine is a cheap product and until the war many a manufacturer's greatest problem was to get rid of his surplus chlorine.

It is interesting to note that the Russians began production of a polychloroprene known as *sovpreno* about 1930.

In 1932, Patrick patented a process for the production of another rubber-like polymer which he named *thiokol*. It is made by treating ethylene with chlorine to form ethylene dichloride.



This is mechanically mixed with sodium polysulfide Na_2S_4 , then the mixture is heated under ordinary pressure about 70°C . for a few hours. A polymer product said to have the structure



is formed. This rubber has many of the properties of neoprene and may be used to make tires.

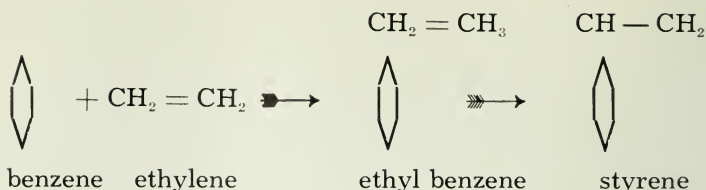
In 1933, Semon patented a process for the production of a polymer called *Koroseal* made from plasticized polyvinyl chloride.

Meanwhile research had been forging ahead in Germany. In 1935, the Germans announced the successful synthesis of a new series of polymers made from butadiene alone. Later they tried adding isobutylene as a "comonomer" and made a fairly successful product called butyl rubber. In 1938, the German army rolled into Austria on tires made of Buna type rubber.

It soon became evident that another World War was inevitable and the United States Government, afraid that their supply of rubber might be cut off asked the four large American rubber companies,—Goodrich, Goodyear, Firestone and Standard Oil to work on the production of a Buna synthetic. The result was called Buna S.

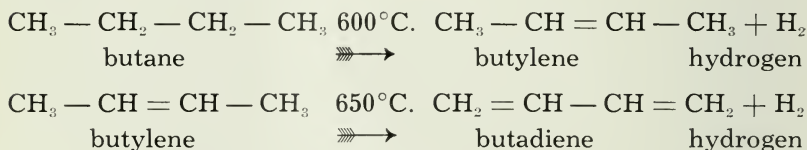
Buna S is built up by the copolymerization of butadiene. The manufacture of both these chemicals is interesting and we shall examine it in detail.

Styrene is made by passing benzene and ethylene vapour over AlCl_3 as a catalyst at a moderate temperature. The two combine to form ethyl benzene. This molecule contains two unwanted hydrogen atoms which are removed by cracking or heating at 950° to form the final monomes. The reactions taking place may be represented as follows:



The production of butadiene is the bottleneck in the production of the Buna rubbers. More than eighty processes for its manufacture have been patented but only a few are commercially important.

Probably the common method for butadiene synthesis in the United States uses butane as a starting point. The butane is led over a catalyst of aluminum and chromic oxides at a temperature of 600°C. Two atoms of hydrogen are split off forming butylene. The butylene is then led back over the same catalyst at 650°C. whereupon two more atoms of hydrogen are split off forming butadiene. The reaction is:



Another method which has received some publicity but which would probably be too expensive is the dehydration of ethyl alcohol using aluminum oxide as a catalyst. Ethyl alcohol vapour is passed under pressure through aluminum oxide. If too pure aluminum oxide is used a large percentage of the unwanted 1-2 butadiene and only a small percentage of the 1-3 butadiene which is desired, is yielded. This is the basis for the "rubber from wheat or potatoes" stories of which we have heard so much.

In Germany where petroleum is scarce butadiene is made using acetylene as a starting point. This is passed into water containing acid and mercuric salt as a catalyst. Acetaldehyde is formed which is used to make aldol. The aldol is dehydrated to butylene which is cracked, as shown above to butadiene.

The next step in the synthesis of Buna S is the combination of the butadiene and styrene. This is carried out by the emulsion polymerization method as is the case of the manufacture of neoprene. The butadiene which is a gas and styrene which is easily liquified, are passed into an aqueous solution containing soap as an emulsifier plus an oxidizer such as persulfate or perborate to act as a polymerization catalyst and a chain modifier, usually a

mercaptan (e.g. methyl mecaptan CH_3HS). The function of this chain modifier is to prevent cross-linking of the chains of molecules. This would form a hard, tough and unworkable polymer.

The emulsified mixture is heated at 40°C . for 15 hours under two atmospheres pressure. The resulting emulsion is a white liquid like natural latex which can be coagulated by the addition of acetic acid and some metallic salt often sodium fluosilicate. The coagulum is skimmed off and washed and dried like natural rubber. It is vulcanized by heating with sulphur just as is natural rubber but a lower percentage of sulphur by weight is needed to achieve the same result.

The following proportions for the various ingredients of a Buna rubber have been suggested:

Butadiene—60-75 parts.

Styrene—40-25 parts.

Emulsifier—1-5 parts.

Polymerization Catalysts—0.1-1.0 parts.

Chain Modifier—0.1-1.0 parts.

Water—100-250.

Often other comonomers than styrene are polymerized with butadiene yielding different polymers than Buna S. Buna N, Hycar, Perbunan, Chemigan and Hycar are trade names for a synthetic using acrylonitrile as a monomer with Butyl rubber.

The Bunas are characterized by their resistance to abrasion and to organic solvents. They age well, have good electrical insulating properties and do not burn readily. It is expected that they will find wide use as a material for tires. They have an added advantage of great importance in wartime; the raw materials for their manufacture are easily obtainable and their use would not curtail the production of any other industrial commodity. Egloff, the president of the American Chemical Society, stated that the American Petroleum Industry could produce 85 billion pounds of butadiene and styrene annually without decreasing its output of other petroleum products at all. On the basis of such production, Egloff predicts Buna S at 15c a pound. In view of Buna's many properties superior to those of natural rubber, this price would probably force the natural material off the market and leave synthetic rubber supreme in the field.

When you have realized the superior characteristics of the various synthetic and the surprising cheapness and ease with which they can be made, I think that you will agree with me, gentlemen, that their future is a brilliant one.



Year Book

1943

EXECUTIVES, CLUBS,
SOCIAL FUNCTIONS

Engineering Society

THE UNIVERSITY OF TORONTO



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DIRECTOR OF COLLEGE
AND PUBLICITY



A. P. CROSBY
TREASURER



J. ABELL
SERVICE PRESIDENT



J. T. CAWLEY
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M. JAYKRUP
SERVICE PRESIDENT



J. J. DAVIS
SECRETARY



H. R. GROSSMAN
PRES. ATHLETIC ASSOCIATION



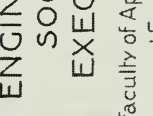
R. E. LEWARK
CHAIRMAN CHEMICAL CLUB



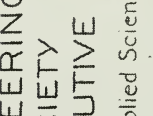
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PRESIDENT INS



J. WARD
PRESIDENT INS



M. AYKROYD
PRESIDENT INS



W. K. SHARPE
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J. A. HURKAN
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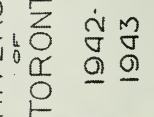
C. WOODWARD
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P. SMITH
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J. G. DICK
CHAIRMAN ENGINEERING PHYSICS CLUB



J. DORE
CHAIRMAN MECHANICAL CLUB



P. W. KELAN
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R. S. GIFFORD
CHAIRMAN DEBATES CLUB



J. A. HURKAN
CHAIRMAN RESORT

ENGINEERING SOCIETY EXECUTIVE

Faculty of Applied Science
and Engineering
UNIVERSITY
OF
TORONTO

1942-
1943

ELECTIONS RESULTS 1942-43

Engineering Society Executive—

President	J. WARD
1st Vice-President	A. GORMAN
2nd Vice-President	P. AYKROYD
Secretary	M. McCULLOGH
Treasurer	R. F. MOORE

Athletic Association Executive—

President	B. WHITE
Vice-President	A. CAMPBELL (Accl.)
Secretary-Treasurer	F. SANSOM

4T4 Executive—

President	A. P. CROSBY
Vice-President	M. HANNON
Secretary-Treasurer	H. McNIVEN
Athletic Representative	A. J. RETTIE

4T5 Executive—

President	J. STUART
Vice-President	D. CURRIE
Secretary-Treasurer	G. WALLACE
Athletic Representative	H. SPENCE

4T6 Executive—

President	A. KLASSEN
Vice-President	D. WHITE
Secretary-Treasurer	R. DAVIDSON
Athletic Representative	J. A. BROWN (Accl.)

Club Chairmen—

Civil	R. MAUGHAN
Mining and Metallurgical	I. R. CURRIE (Accl.)
Mechanical	J. P. MEHRTENS
Architectural	L. BAKER
Engineering Physics	W. J. WEIR
Chemical	J. HAYMAN (Accl.)
Electrical	R. ASPINAL
Debates	G. GILCHRIST (Accl.)

Bronze "S"—

D. GROSSKURTH

4T3 Permanent Executive—

President	M. J. AYKROYD (Accl.)
Vice-President (2)	{ J. T. CAWLEY
	{ W. A. MOESER
Secretary-Treasurer	J. M. DYKE
Councillors—	
Department 1	G. H. WORKMAN
Department 2	J. DICKIE
Department 3	G. BIGGS
Department 4	R. FAIRFIELD
Department 5	R. MULLER
Department 6	R. QUITTENTON
Department 7	R. NAYLOR
Department 8	F. KELLAM
Department 9	J. PLAXTON

SOMETHING NEW HAS BEEN ADDED IN S.P.S.

This year for the first time a group of Engineers formed a branch of the Varsity Christian Fellowship in S.P.S. The V.C.F. has been effective on the main campus since 1929.

The group in School is made up of undergraduate engineers from all departments and years who believe that the "Faith of Our Fathers" is a living faith. Their membership accepts and upholds the Christian principles that are laid out in God's own authoritative Word, The Bible.

The program of the Engineering Branch of the Varsity Christian Fellowship consists of weekly noon hour meetings along with several special functions throughout the year. Men, outstanding for their Christian testimony, are brought to S.P.S. to speak at these meetings. Many of these men are prominent in business fields and their messages show how real Christianity can be made practical in the world of today.

A highlight in the year's program was the Stag Dinner held in the Great Hall at which over a hundred attended to hear Evangelist James A. Stewart. His many experiences in war-torn Europe enabled him to speak with authority and interest.

The group plans an even broader sphere of activity next year. Work is now under way for their new program. It is a work throughout School for all Schoolmen. Any undergraduate engineer or member of the staff is welcome at any or all of their meetings.

D. M. ALLOWAY.

FEMMES IN ARCHITECTURE

Note to the Editor: Please do not try and photograph us. I am sure and certain we'll confiscate the film this time, and besides, headaches are better avoided if possible.

Marriage has made its impression on those "in days of yore" happy faces of all who succumbed to its mastery in the past year. A few still hold forth unwedded—career women, they are often called!!

Speaking of these unwedded ones we have a rather phenomenal thing in fifth year—i.e., an *unmarried* woman. The name is Jean Taylor and her sole ambition at the moment is for the war to end on or about April 21st of this year, so she may stick to her plans of four years' standing and return to England at that time. More power to her high ambitions. We feel, however, that Canada has done Jean a lot of good. Could you believe that that demure, shy fish out of water individual that started in at U. of T. four years ago, now chases the boys from one draughting room to another? (You should have seen her take two coats of oil and several splinters from our best quality quarter cut oak floors, as her last chase ended up in a slight misfortune—yes, she's still alive.) —Note to editor: Guess you figure that is enough for Jean Dunston Taylor.

While we're on fifth year, I suppose we will have to lower ourselves sufficiently to realize that, although married, Martha Jean Stewart Leitch is graduating with a B.Arch degree this year, and warrants a word. On August the eighth, 1942 (John had a forty-eight that weekend), the die was cast. Marty put marriage before career—but not by much. Two or three months of it made her content to haunt "School" for further education—(note: I said education). And so, our hats off to the first married woman to graduate in school (better check on that one, but it's a good bet).

The numbers of the fair sex in fourth year seems to fluctuate considerably. Our well seasoned Mrs. Young started off nobly this fall, but when the R.C.A.F. brought Jack back to civilization, she pulled up stakes again. Although we were sorry to see her go, the rest of fourth year have been getting a lot more attention in the Structural Design labs.

Which leaves Mary Imrie "alone in her glory" (to quote 1941 *Transactions*) in fourth year. Somehow she doesn't seem to suffer much in her solitude. She hails from the west and by the looks of her latest design—remodelling her home town—it must be quite the place. We don't like to hurt her feelings by saying in just

what way, but you go take a look at it yourself, and be your own judge.

Third year has decreased in number from 7 to 3. Only one of these, we are glad to report, was due to feminine flippancy. We mourn the loss of Sheilagh MacDonnell Rounthwaite (quite a mouthful, isn't it), but feel rather secure in the fact that she married an architect. The event occurred Christmas Eve, and was a considerably surprise to many. (Sheilagh is the secretive type—if only you knew her!!) She runs around considerably between Toronto, Petawawa and the Sioux, and we look forward to her visits to keep the department out of the doldrums.

Alice Ayer has been writing essays this year—that may seem like a rather studious statement—but these essays you know. It seems to take three weeks to select a topic, four and a half to get the material together, three more to change your mind and start over—well naturally the call date is past. Poor Alice! Oh well, we hope that by April 8th, most of them will be handed in, even if only in pencil notes. Alice is, however, most proficient at making light fixtures. Any Saturday morning in the modelling room we find her absorbed in her work (I said “in her work”—Alice is a changed girl).

Last but not least we have “missing”, more commonly known as Pegeen Synge. Peg seems to divide her time between making peace between Alice and Herbie, and picking fights with Chuck (they've gotten past that coy stage you know). Which reminds me, for months poor Peg went around gracefully showing off her fourth finger, left hand. She finally had to spread the news around by the grapevine method herself—how disappointing. So she will be one of these graduating with the prefix “Mrs.” unless I lose my guess.

We are going to write a special letter to the Registrar next fall, notifying him of the urgent need of the feminine touch in Architecture, and see if we can't bring some new life into next year's *Transactions*.

GIRLS IN ENGINEERING

Bernice Sinke from Calgary, Alberta, is in first year Electrical. She attended Crescent Heights High School there, and says she likes the West better than the East. Bernice is a real radio ham, having built her own receiver and transmitter, and her call letters are VE4SI. However, her licence has been suspended for the duration. She likes photography, hockey, softball and tennis, and is a pledge of Tridelta.

Kay Taylor came from Oshawa High School and now resides in Toronto, and is a first year Chemical. She likes skiing and skating, and thinks School and Schoolmen are wonderful. Kay says she went into Chemical engineering because she likes maths and chemistry. Kay is another pledge of Tridelta.

Phyllis Pugh, 18 years old, hails from Chatham and the Chatham Collegiate Institute and is in first year engineering. She likes studying books on aeroplanes and aeronautics, and has several flying hours to her credit. Her favourite sports are tennis and swimming. Phyllis thinks S.P.S. is wonderful and she likes the Engineers, although they are pretty broadminded. She hopes to go into aeronautics on graduation.

Margaret Beedham, 18 years old, comes from Toronto, North Toronto Collegiate—a bit of a brain, too, six firsts and three seconds. She likes all sports and dancing, and won an Archery Championship two years ago; she also got the Kerr Trophy for Outstanding Girl. She didn't want to be just a chemist so she went into chemical engineering with the hopes of going into food chemistry when she graduates. Margaret is Secretary-Treasurer of 4T6 and likes it very much, her opinion of School and Schoolmen is tops.

Peggy MacCorquodale, from Toronto, is in third year chemical engineering. Peggy is a Tri Delt fraternity member and is well known around School. She worked at Canada Metals last summer. For those who don't know, Peggy's first name is Ailsa.

Sally MacDonald, from Toronto, is in third year engineering physics. Sally would have graduated this year, only she got such a good job with Sutton-Horsley at the end of her second year that she stayed on for a year. Sally is about the most energetic person on the campus. Her favourite hobbies are dramatics, swimming, hiking and camping.

Claire Jones. Claire, too, is from the city and is a graduate of Humberside C.I. and will soon be a graduate of S.P.S. She worked at the Victory Rubber Co. last summer, and at present she is undecided as to what she will do after graduation this spring. Claire is a very good worker, good swimmer and a wonderful dancer.

Audrey Rushbrook, who is also graduating in chemical engineering this spring, hails from Toronto and the Bloor C.I. Audrey has several hobbies, among them photography, dancing, she used to give dancing lessons, and believe it or not, she analyzes hand-writing. Audrey is a TriDelt, and worked at C.I.L. in Brownsburgh, Quebec, last summer; she hasn't said anything about her future plans after graduation.



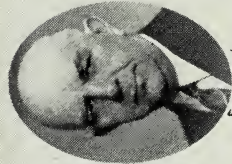
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HON. VICE CHAIRMAN



WM. STORKIE
HONORARY CHAIRMAN



G.H. WORKMAN
CHAIRMAN



E. HEWSON
HON. VICE CHAIRMAN



R. MAUGHAN
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R. RITCHIE
TREASURER



D. A. WHITE
SECRETARY



A. DALLIN
4TH YEAR REP.



N. PAPPAS
2ND YEAR REP.



W.K. SHARPE
1ST YEAR REP.



W. BECK
1ST YEAR REP.

CIVIL CLUB EXECUTIVE

Faculty of Applied Science
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UNIVERSITY
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TORONTO

1942-1943

*Published
Toronto*

CIVIL CLUB

The light on the horizon is growing brighter and as it does so, the events of the past year are brought into view, some brightly, others a little obscure. To lay inference on the hardships of arranging meetings and functions due to the war time activities of School would be merely passing the buck, particularly now that this is the third year of war acceleration.

The Civil Club started at a gallup, topping all previous memberships with an enrollment of 238 students. On October 9th, seventy per cent of this number attended the initiation stag which was held at the Windermere Hotel. Many and varied were the devices inaugurated by second year. This along with food and song provided a great evening for the large number present.

On November 10th, a dinner meeting of the Club was held at Hart House, at which time the Honorary Members were introduced. The words of encouragement and the future field of practice outlined by these proven men of our profession were gratefully received by all those concerned. The feature of the evening was the awe-inspiring sound film donated by the Dominion Construction Corporation on the "Building of the Abitibi Canyon Project".

It was deemed advisable by the executive of the Club to withdraw any ideas on having a formal field trip due to the war time restriction on travel.

While the snow was still lying thick and crisp throughout the countryside a sleigh ride party was arranged for January 29th at Willowdale Riding Club. Although this was not attended as expected, the fellows did have a good time. The senior members of the Club most gladly supplied the night's entertainment at no extra expense. The sleigh ride over, food and dancing at the Riding Club were greatly received amid the sudden outbursts of "Hiya Turk".

Due to the necessity of early publication two scheduled meetings still to take place will have to remain under the column heading of events yet to come.

To all members of the Club Executive may I take this opportunity of thanking you for your splendid co-operation and in relinquishing the chair I wish every success to the forthcoming Civil Engineers.

G. H. WORKMAN,
Chairman.



J. McCune
SECRETARY-TREASURER



R. G. Blangford
FACULTY SPONSOR



J. Gordon Hearn
HONORARY CHAIRMAN



W. Keller
CHAIRMAN



C. W. Knight
ALICE COUNSELLOR



J. Cummings
3RD YEAR MINING REP.



J. H. Lewis
4TH YEAR MINING REP.



J. H. Lewis
4TH YEAR MINING REP.



J. H. Lewis
4TH YEAR MINING REP.



R. B. Bister
4TH YEAR METALLURGICAL REP.



J. King
3RD YEAR METALLURGICAL REP.



W. G. Knochling
1ST YEAR METALLURGICAL REP.



R. Taylor
3RD YEAR MINING REP.



R. Watson
2ND YEAR METALLURGICAL REP.



R. Watson
2ND YEAR METALLURGICAL REP.



R. Watson
1ST YEAR MINING REP.

MINING AND METALLURGICAL CLUB EXECUTIVE

Faculty of Applied Science
and Engineering

UNIVERSITY
OF
TORONTO
1942-1943

MINING AND METALLURGICAL CLUB

A record membership and good spirit of the students has done a great deal in making this year a successful one. Too little stress has been laid on the importance of having every member feel that he has an important part to play in the club's activities. This type of association leads to a more active society and it is our duty to carry it out to the fullest extent to make the club a better one with each passing year.

We were indeed fortunate in having Mr. J. Gordon Hardy, President of Falconbridge Mines, as our Honorary Chairman. Mr. Cyril W. Knight ably acted in the capacity of counsellor to our association with the American Institute of Mining and Metallurgical Engineers. Once again we are indebted to Professor G. B. Langford, our Faculty Sponsor, who seems to be an essential part of the club's life.

Our activities for the year began with the Annual Freshman Reception. This was followed by two luncheons at Hart House, at which Mr. G. S. Mallet, of Anaconda American Brass and Mr. Hardy spoke respectively. The annual dinner held at the Engineer's Club, completed the year's activities. Dr. F. E. Keep was the speaker at this function and his very interesting talk was the highlight of our evening.

The annual field trips to Hamilton and Orillia were not held this year, due to transportation difficulties.

F. W. KELLAM,
Chairman.



R. R. WANGUS
NON-VICE-CHAIRMAN



J. M. DYKE
CHAIRMAN



A. C. BLOUÉ
HON. CHAIRMAN



J. PAUL MEHRING
VICE-CHAIRMAN



G. L. S. BIGGS
4TH YEAR REP.



NORMAN A. BROWN
3RD YEAR REP.



DOUGLAS CURRAN
2ND YEAR REP.



J. BROWN
1ST YEAR REP.



L. GINSLER
1ST YEAR REP.

MECHANICAL CLUB EXECUTIVE

Faculty of Applied Science
and Engineering

UNIVERSITY OF TORONTO

1942-1943

Spalding

MECHANICAL CLUB

The Mechanical Club has carried out as planned, one meeting a month. Our October meeting was addressed by Professor L. J. Rogers, who gave an interesting talk with movies on "Glass Making at Research Enterprises, Ltd." In November, Mr. M. N. Vuchnich, of the Lincoln Electric Co., gave an address on the "Future of Arc Welding" which was followed by a lively discussion. Mr. Vuchnich also showed movies of his trip through South Africa.

December brought us around to our dance which was held in the U.T.S. Gymnasium. Refreshments and entertainment were provided and the evening was entirely successful. It was the first time that the club held a dance on its own and because it was so successful, I should like to see it carried on.

In January a joint dinner meeting was held with the student A.S.M.E. in Hart House at which Mr. W. A. Osbourne, of Babcock-Wilcox and Goldie-McCulloch spoke on "X-rays in Industry".

Finally our dinner took place at the Granite Club when Mr. A. C. Blue, our honorary chairman and Mechanical Engineer of Polymer Corporation addressed the meeting. Entertainment was provided and the activities of the club closed in royal style.

As the year and my term of office comes to an end, may I thank the executive and my friends for their co-operation and support; and also the honorary Vice-Chairman, Professor Angus and Professor Wiren for their able advice. In conclusion I wish the club every success in the coming year.

JOHN M. DYKE.



L.G. BAKER
VICE-CHAIRMAN



J.A. MURRAY
CHAIRMAN



J.H. CHARLES
5TH YEAR REP.



C.R. WORSLEY
4TH YEAR REP.



H. MACNEW
SECRETARY-TREASURER



MISS FEGGEN SMITH
3RD YEAR REP.



R.H. CRAWFORD
2ND YEAR REP.

ARCHITECTURAL CLUB EXECUTIVE

Faculty of Applied Science
and Engineering

UNIVERSITY OF TORONTO

1942-1943

*Freeland
Toronto*

ARCHITECTURAL CLUB

So here we have come to the rather melancholy business of retrospection. First the dear dead days of Gull Lake, sketching and loafing about in September sunshine 10% and rain 90%. And we recall with nostalgia that famous "first night" performance of the Gull Lake Follies when caricatured members of staff and students had their souls laid bare to make a Roman holiday for the assembled camp.

On our return to this seat of yearning, we were met by the largest class of freshmen in our course since Cheops draughted up his pyramid. Under the guidance of "Daddy" Garswell and the vim of our new staff acquisition Mr. Adamson, the boys are rattling down the bumpy road of design in fine style.

To help ease these and other sundry bumps, the club indulged in a grade A large fall barn dance for which, in the grand manner we rented an entire country hall, an oscillating street-car and a symphony ensemble of three pieces.

Our serious activities have been well represented this year, with such highlights as an argumentative meeting on the Architect in the Post War World, led by Fin McKenzie and Bob Fairfield and much staff student consultation leading we hope, to less noise in the draughting room, etc., etc.

The peak of the club's activities was the famous "Why Do Our Cities Stink" meeting held in the Hart House theatre. The meeting was well attended by civic dignitaries, town planning authorities, members of the profession and interested bystanders. Inside the theatre—three excellent movies, an excellent address by Professor Coventry (to whom we extend our thanks), three superb addresses by Bob Fairfield, Fin McKenzie and I might immodestly add, yours truly, all ably chairmanned by Chuck Worsley; in the lobby, an exhibition of student work, arranged by Laing Baker, your club chairman for 1943-44. We heartily recommend continuation by the club next year of these meetings for they met with great enthusiasm and have since brought much favourable comment from the profession.

Well lads, the fifth year, that infamous group of seven are leaving your midst. The tumult and thunder of their ways go with them and the place should be much quieter. From them to you, through me, au revoir, its been a swell trip. From me to you thanks for all the co-operation received. I regret very much that pressing war work cut down so much the time I gave to the club and particularly to its Sample Room. Laing Baker and his executive will, I am sure, make up for my deficiencies.

Thanks again. So long gang.

JIM MURRAY, *Club Chairman*



R.V. SMITH
SECRETARY TREASURER



J.A.G. DIACK
CHAIRMAN



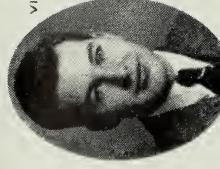
DR. L. GILCHRIST
HONORARY CHAIRMAN



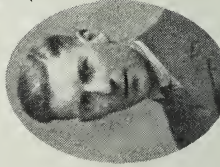
W.J. WEIR
VICE-CHAIRMAN



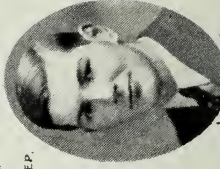
R.A. MULLER
4TH YEAR REP.



D.S. JOHNSON
3RD YEAR REP.



A.C. McDONALD
2ND YEAR REP.



J.H. RATCLIFFE
1ST YEAR REP.

ENGINEERING PHYSICS CLUB EXECUTIVE

Faculty of Applied Science
and Engineering

UNIVERSITY OF TORONTO

1942-1943

*Prepared
at Toronto*

ENGINEERING PHYSICS CLUB

The activities of the Engineering Physics Club for this session began early in the fall of 1942 with the Annual Freshman Dinner, held in Hart House. The guest speaker of the evening was Dr. Satterly of the Physics Department, who addressed some timely hints to the freshmen in particular and to one and all in general. Following the formalities of the evening the great and noble ceremony of initiation was performed on the freshmen. With an eye to the future of Sophomores it is hoped that the freshmen classes do not increase by such large amounts each successive year; for some day these green tie freshmen are going to take a quick census and find that they outnumber the other three years all combined.

The second meeting of the year was solely an undergrad effort with many of the club members giving short informative addresses on the type of work they had been employed at during the previous summer.

The final meeting of the first term was featured by an illustrated address by Mr. Kent Duff of the H.E.P.C., on the "Fundamentals of Frequency Control". Following this meeting the rather small turnout adjourned to satisfy their appetites for refreshments sufficient for twice their number, and once again a good time was had by all.

The Club having had its fill of "sitting" meetings staged a very successful dance just prior to the Christmas holidays. The attendance at the dance was good considering that only a couple of freshmen found time from their exam studying to attend, and the whole affair paid for itself with just a little to spare.

The spring term meetings were opened with the showing of two motion pictures, "Frequency Modulation" and "Colour Magic" through the courtesy of the Canadian General Company. Two of the fourth year men from the electrical option presented summaries of their greatest efforts in four years, their thesis.

A final dinner meeting was held before exam time rolled around and the club's activities for the year were brought to a stand still.

In closing, your chairman would like to thank his executive for their fine show of cooperation, and Dr. Gilchrist for his kind assistance, and the club members for their fine show of spirit; may it ever be thus.

JIM A. G. DIACK,
Chairman.



B.T. JOHNSON
VICE-CHAIRMAN



J.D. WILCOX
SECRETARY-TREASURER



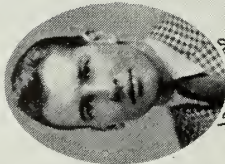
R.F. LEWEARRE
CHAIRMAN



DR. R.R. McLAUGHLIN
HON. VICE-CHAIRMAN



L. MACDONALD
3RD YEAR REP.



J.D. STAFFORD
2ND YEAR REP.



K.R. BRIGHAN
2ND YEAR REP.



A. COOKE
1ST YEAR REP.



G.R. SHAW
1ST YEAR REP.

INDUSTRIAL CHEMICAL CLUB EXECUTIVE

Faculty of Applied Science
and Engineering

UNIVERSITY OF TORONTO

1942-1943

*Spetchard
Toronto*

INDUSTRIAL CHEMICAL CLUB

For thirty-five years, the Industrial Chemical Club has played an active part in the life of the student chemical engineer. Through the functions and activities of the club, the student was brought into contact with many of the phases of the Chemical Industry which might otherwise escape him.

Club activities, insofar as field were concerned, were seriously curtailed this year due to wartime restriction, both on travel, and in the matter of obtaining permission to visit various plants. However, in early January some forty members of the fourth year received a first-hand lesson in brewing methods and practise, as carried out at the Canada Bud Breweries in Toronto.

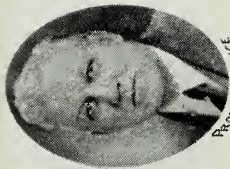
The other club meetings, with the exception of the Freshman Reception which took place in a downtown hotel, took the form of dinner meetings in Hart House. Prominent chemical engineers such as Mr. John Buchan of the Bakelite Corporation, and Mr. Harold Watson of the Dominion Synthetic Rubber, addressed the club after the dinner.

Those responsible for the operation of the club this year, would like to take this opportunity of wishing all the graduates of '43, and especially the graduates in Chemical Engineering, all the health, wealth, and happiness possible for the years to come.

R.F. LEWARNE.



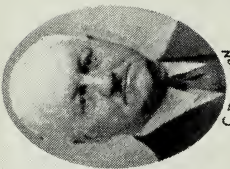
A. R. QUENTIN
SECRETARY-TREASURER



PROF. H. W. PRICE
HON. VICE-CHAIRMAN



P. D. SMITH
CHAIRMAN



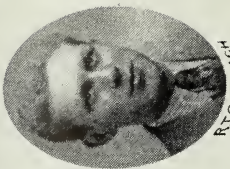
C. E. SISSON
HONORARY CHAIRMAN



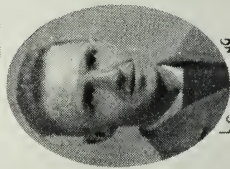
R. W. NAYLOR
4TH YEAR REP.



R. H. ASPINALL
3RD YEAR REP.



R. T. CAVANAGH
2ND YEAR REP.



L. C. W. FLEMING
1ST YEAR REP.



J. H. TURNBULL
1ST YEAR REP.

ELECTRICAL CLUB EXECUTIVE

Faculty of Applied Science
and Engineering

UNIVERSITY OF TORONTO

1942-1943

*Prepared
for Toronto*

ELECTRICAL CLUB

This year, in spite of increased demands upon spare time, the Electrical Club has rung up another successful session. One of the contributing was the institution of compulsory Club fees, which has been a great help to the Executive in planning activities.

The season opened with a freshman reception on October 13. Following the investiture of new members, five of the Fourth Year men spoke on summer employment, relating some of their own interesting experiences. Sid Lorraine showed the quickness of the hand over the eye in a demonstration of sleight-of-hand and magic.

Thursday, October 29th, the scene shifted from Hart House to the Canadian General Electric Davenport Works, when over two hundred members explored the intricacies of the large manufacturing plant. This trip was the result of considerable organization, both by the Executive and the General Electric.

Professor Joslyn Rogers divulged some of his colourful career, in the application of scientific methods to crime detection, at the November Smoker. Movies shown by Ted Beatty from the Anaconda Brass also contributed to the enjoyment of the evening.

The December meeting followed a somewhat different pattern, in the form of a Mock Parliament. The Bill before the House was one on the education of an engineer, and speakers from all four years attacked or upheld the Bill. The perfect lab party was demonstrated by the Fourth Year Laboratory Workshop Players, who presented the drama, "Ohm was never like this". A film from the T.T.C., "Forty million miles a year", described maintenance of the lines and cars of a large transportation system.

During December also, the Club arranged a field trip for the Fourth Year to the Leaside Transformer Station of the H.E.P.C. This was voted most successful, for all parts of the plant were thoroughly inspected by those who turned out.

On Friday, January 22nd, the Club had a joint meeting with the Toronto Section American Institute of Electrical Engineers. Four of the Fourth Year men presented technical papers for prizes offered by the section.

Such activities are only possible through the combined work of the Executive and the Club members, and a vote of thanks is due to the many who gave of their time and ability to assist at the meetings.

P. D. SMITH.



R.E. SCOTT
CHAIRMAN



D.M. MILLARD
1ST YEAR REP.



D. SCHMIDT
3RD YEAR REP.



PROF. F. R. ZIMMER
HON. CHAIRMAN

DEBATES CLUB EXECUTIVE

Faculty of Applied Science
and Engineering

UNIVERSITY OF TORONTO

1942-1943

*Re-elected
1942-1943*



G.C. GILCHRIST
SECRETARY



G.M. NIXON
4TH YEAR REP.



D.M. ALLOWAY
2ND YEAR REP.

DEBATES CLUB

The S.P.S. Debates Club exists for the promotion of the ability to think on one's feet amongst the Undergraduate Student body. It operates on a grant from the Engineering Society and all the undergraduates are automatically members although far too few of them partake of its advantages. During the course of the year it offers prizes for debating, for public speaking, and for impromptu speaking. It is on the whole run fairly informally and discussions after the debates in which all may join have proven especially stimulating.

In the fall Jim Henry and Dick Muller tried to decide whether the Engineer should be forced to take drill on the campus and found that he must.

An innovation this year was a debate held before the Engineering Society at their regular meeting on November 4th. The debate was between Victoria and S.P.S. on the subject: "Resolved that Artsmen are more useful members of Society than Schoolmen" and the affirmative was upheld by Miss Barbara McNabb and Victor Butt of Vic and the negative by Ron Scott and George Nixon of School. This was the first time for a number of years as well that School had ventured into the interfaculty debating field.

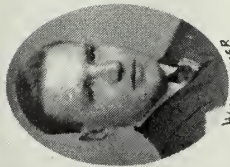
The most enthusiastic meeting of the year was as usual the Annual Impromptu Speaking Contest. This was held in Hart House, on December 3rd, and six prizes were given in all, the first to Taylor of second year, and others to Kempthorne, and Gerson of second year and Muller, Drapkin and Reilly of fourth year.

The preliminary competition to determine the six men who were to speak at the Engineering Institute of Canada's Annual Student Night was held by the Club. The six winners were all given memberships in E.I.C. and for the final winners there were cash prizes as well.

The Segesworth Trophy debates between the years were originally held for Pewter Beer mugs, the gift of Mr. Segesworth, an old graduate of School. Since it was impossible to obtain them this year, cash prizes were given instead.

At the close of the year, which had been a difficult one, and one in which spare time has been at a premium, the chairman wishes to thank the members of the executive for their faithful work, and especially the Honorary Chairman, Professor A. R. Zimmer for his help throughout the year. The best of luck to next year's executive and may they have a really successful year.

R. E. SCOTT, *Chairman*.



W.A. MOESER
PUBLICITY



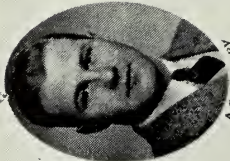
J.T. CAWLEY
PRES. ENG. SOCIETY



G.R. HEFFERNAN
VICE-CHAIRMAN



M.J. MCKAY
CHAIRMAN



A.P. CROSBY
FINANCE



P.H. MCKAY
ENTERTAINMENT



R.C. QUITTEN
MARSHALLING



F.W. KELLAM
RECEPTION



L.G. BAKER
DECORATIONS



J. BELL
TICKET SALES



J. WARD
ACCOMMODATION



H.R. AGNEW
PROGRAMMES

SCHOOL DINNER COMMITTEE

Faculty of Applied Science
and Engineering

UNIVERSITY
OF
TORONTO

1942-1943

*Richard
Hartman*

FIFTY-THIRD ANNUAL SCHOOL DINNER

On November 19th, despite the rationing of essential foods, Hart House chefs prepared their best meal of the season, featuring succulent Swiss steak for six hundred and forty Schoolmen. Waitresses were recruited from the ample supply of experienced girls in the Arts Colleges and worked willingly to serve the hungry men.

The Dinner programme was opened by the head table guests procession preceded by a Boar's Head borne on a litter carried by Schoolmen in traditional engineer's garb.

Following the meat course the House lights were suddenly dimmed and to the tune of the National Anthem a large Union Jack was unfurled over the head table, and under spotlight was activated by several electric fans, presenting a spectacular background for the toast to the King.

Toast to the University by Gerry Heffernan was returned by President Cody and followed by the presentation of the scholarships to the "Honour boys" in the School, by W. C. Miller, President of the Association of Professional Engineers.

Feature of the evening was the guest speaker, Dr. W. E. McNiell, B.A., M.A., PhD., Vice-Principal and Treasurer of Queen's University, whose fame was outlined in the souvenir Toike Oike programme.

Dr. McNiell spoke eloquently on a subject new to Schoolmen "What have you to Declare" and awakened new interest in men for the higher planes of literature and learning. During his talk Dr. McNiell proved his mastery of the English language by quoting from memory over 200 lines of poetry and prose taken from the works of some 14 authors. He illustrated his talk with examples from the lives of a dozen prominent men proving that good books and poetry can be a guiding spirit in every day activity.

Following Dr. McNeill's address the Dinner guests relaxed with some light entertainment provided by "Bob Hope" and Ken Van Wyck, a third year "Sam Small".

Mr. MacDonald, Chairman of the Board of Governors, presented the Gold Keys to the graduating members of the Engineering Society Executive. Jim Dickie, fourth year president, toasted the School and Dean Young replied.

The Dinner programme was concluded by a few words from S. R. Frost, of the Wartime Bureau of Technical Personnel, outlining the undergraduate Engineer's position in 1943.

The President of the Engineering Society then thanked the gathering for their attention and the dinner was brought to a close in the traditional manner by a lusty TOIKE OIKE.



W.A. MOESER
PUBLICITY



A. GORMAN
VICE CHAIRMAN



H. JAYKROND
CHAIRMAN



A. CROSBY
FINANCE



G.R. HEFFERNAN
RECEPTION



N. BALES
TICKETS SALES



J. WARD
ACCOMMODATION



J. MURRAY
DECORATIONS



CH. WORKMAN
DELEGATES

SCHOOL AT-HOME COMMITTEE

Faculty of Applied Science
and Engineering

UNIVERSITY OF TORONTO

1942-1943

*Prepared
1942-43*

SCHOOL AT-HOME

Once again School has led the way to saner organizations of student activities and once again her decision has been acclaimed a success! This year, Schoolmen, with their inborn economic instincts again made the School at Home a social financial success.

Thursday, January 14th, saw that well known rendezvous by the lake—the Banquet Hall at the Royal York—transformed to a place of rhythm and beauty while five hundred loyal Schoolmen and their ladies danced to the music of Canada's finest, Mart Kenney, of the Brant Inn, at Burlington.

Feature of the evening were the individual corsages for all the ladies, presented with the compliments of the committee.

Of course the architects showed their ability by decorating the hall in the most unusual of fashions. Time being a factor for the boys they papered the walls and affixed large crayons to the paper and let every man do his (or her) own decorating. Sufficient to say, the results were amazing.

Adding to the enjoyment were the 10 spot dances, the Ping-Pong balls dance, all with prizes, some 30 in number.

At 2.30 a.m., the sweet music faded away and with a lusty Toike Oike the weary Schoolmen wended their way homeward and elsewhere.

The distinguished patrons and patronesses were: President and Mrs. H. J. Cody, Dean and Mrs. C. R. Young, Professor and Mrs. R. W. Angus, Professor and Mrs. J. W. Bain, Professor and Mrs. R. R. McLoughlin, Lieut.-Col. and Mrs. W. S. Wilson, Professor and Mrs. W. J. T. Wright, Professor and Mrs. A. R. Zimmer.



W.A. MOESER
PUBLICITY



R. HAUGHAN
VICE CHAIRMAN



J. WARD
CHAIRMAN



J.T. CAWLEY
PRES. ENG. SOCIETY



A. CROSBY
FINANCE



J.K. BINGHAM
STAGE MANAGER



H.W. DOUGLAS
RECEPTION



M. JAYKROND
REVUE DIRECTOR



P.D. SMITH
DELEGATES



B.L. HAMLIN
TICKET SALES



G.R. HEFFERNAN
ACCOMMODATION

SCHOOL NITE COMMITTEE

Faculty of Applied Science
and Engineering

UNIVERSITY
OF
TORONTO
1942-1943

*Revised
1943*

SCHOOL NITE

On Friday night, February 5th, Schoolmen hung the S.R.O. sign up at Hart House. The yearly presentation of the School Nite Review was a sell-out with over 1,100 engineers and their fair partners present at the festivities.

Due to wartime restrictions, the Revue was absent from the programme this year. But in its stead, two skits were presented in the Big Gym and the Great Hall during intermission. The capable management of the Aykroyd Freres—Maurice and Pete, ensured its success. Many thanks are given to all those who helped to perform and produce the skits. Suffice to say that the quality of the skits was up to the usual School standard.

As in the past, variety was the keynote of the night's entertainment. Six orchestras were scattered over the building; the Mermaids performed in the pool; and moving pictures (ably spelled by a magician were shown in the theatre. Movies of survey camp life, and a musical short were well attended by the assembled throng.

Morgan Thomas performed for the dancers in the Big Gym, and the Modernaires in the Great Hall. Charlie Hannigan with his two bands, Mell Hamil, and Fred Evis were also in attendance. Add to this the "Record Men" in the Orderly Room and you can see that the musical notes were fairly jumping all night. The music ranged from sweet and soft to hay in the loft.

To present this year's entertainment, the committee was faced with, but overcame, many wartime restrictions. The loss of the theatre for the presentation of the Revue, the ban against serving food, rules concerning lighting and the shortage of help combined together to give the committee a few sleepless nights. But in the face of all these things, the show went on, and at a lower price than before.

So, to the committee as a whole, to the Aykroyd brothers, to the men connected in any way with the skits, and to all those who were responsible for a perfect night's entertainment, thank you—it was tops.

The distinguished patrons and patronesses who added to the occasion by their presence were: President and Mrs. H. J. Cody, Dean and Mrs. C. R. Young, Professor and Mrs. R. W. Angus, Professor and Mrs. J. W. Bain, Professor and Mrs. Treadgold, Professor and Mrs. W. J. T. Wright, and Professor and Mrs. A. R. Zimmer.



R.C. QUITTENTON
SPORTS EDITOR



F.J. GLYSACHT
EDITOR



L. J. LENNON
ASSISTANT EDITOR

TOIKE OIKE STAFF

Faculty of Applied Science
and Engineering

UNIVERSITY OF TORONTO
1942-1943

*Published
Toronto*



W.A. MOESER
DIRECTOR OF
PUBLICATIONS & PUBLICITY



D. DRAPKIN
FEATURE EDITOR

TOIKE OIKE

Toike Oike, which is published to celebrate every momentous occasion in the life of an embryo engineer, has seen another successful year. Each edition brings Schoolmen up to date news on the current events of School, as well as keeping them abreast of the School Sports World in its column Sportoike, for this reason it comes out "every now and then".

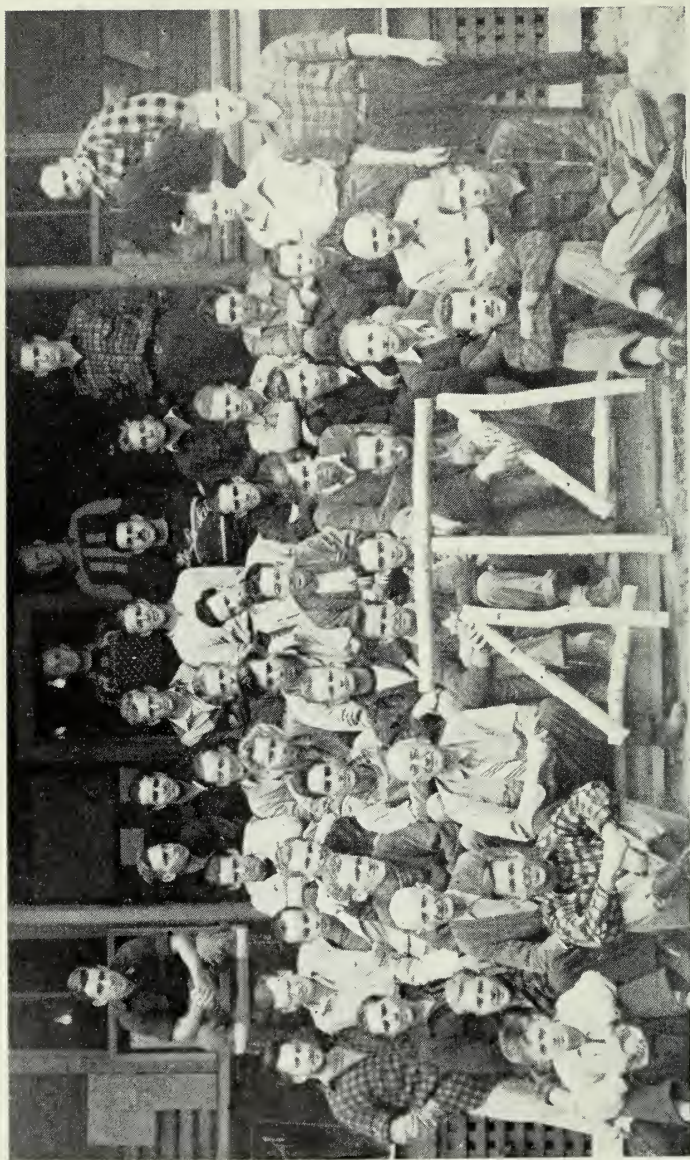
At the beginning of this 1942-43 Session, *Toike Oike* took the unwary Freshman by the hand and led him through his Initiation and then introduced him to his Senior Schoolmen at the Freshman Reception.

Toike Oike then stepped into the ranks of the large journals and appeared at the School Dinner dressed up in an especially designed cover, devoting its pages, 14 in all, to the history and amusing events of School from the time of the first School Dinner down to the present. As well as providing the menu and programme of the evening there were articles on the Engineering Society, the Alumni and Sports, thus it presented itself as a momentum of School.

Next the Green Issue or Christmas Edition appeared, followed by a colourful School-At-Home and a riotous School Nite Edition. The dates of the election and Graduation Ball being side by side turned *Toike Oike* into a daily paper and kept the Staff going day and night in order that the very latest news on these events might be brought to every Schoolman.

The year has passed quickly, but we want to pause here, and thank, most sincerely, all those who contributed to *Toike Oike* and at the same time to wish future *Toike Oike* Staffs the best of luck for bigger and better papers.

F. LYSAUGHT.



GULL LAKE 1942

SURVEY CAMP — GULL LAKE

*In nineteen hundred and forty-two
Miners and civils set sailo
From north, south, east and west
In search of a*

. . . . but instead of going to New York Town — with ships and cargo—forty students migrated to Minden in taxis, cars, trains, buses and jalopys (on foot) to spend six short weeks at Survey Camp.

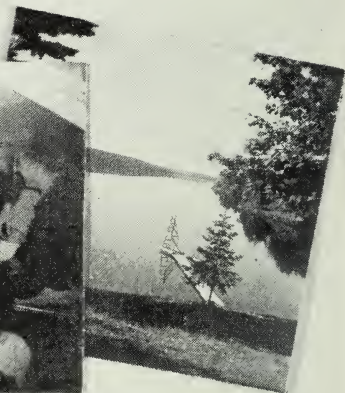
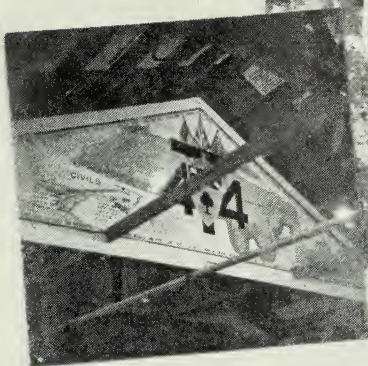
The opening session with “Treddy” warned us all of the evils—and gave us a few house rules which we did try to keep. With Ballsy’s ford doing most of the work, the boys soon explored those notorious night-spots, the “Boot”, Deer Lodge and the TWO hotels in Minden. On their report, all the best intentions were forgotten and it was soon realized that a “Scooping score-board” was desirable if not necessary. Will anyone ever forget those three sleep-walkers, Maughan, Noble and Moffat that first week. Remember those meal-time rushes (for the first two weeks) when even fried potatoes and the smell of chlorine couldn’t keep the boys away from the screen door.

After the first couple of weeks of stadia work et cetera it was realized that one man could carry the party—on alternate days of course. Oh, those siestas! Wasn’t it about then that the two famous “Yachters” pulled that fake out in the lake? And incidentally who did Nick take to School-Nite?

And then our Social Highlight—the Bunkhouse Brawl. The setting approached extravaganza even if our materials were of the “back-house” variety. The boys really pitched in and did a fine job of cleaning up—yes even under the beds. More individual plans for the evening began to materialize when a bevy of beautiful girls arrived, unescorted except by Workman—who immediately lost most of them. Our m.c. recuperated awfully fast before curtain time, didn’t you George? Did Ronny ever get a prize for the best act, the Brown boys for their two-song sensations, or Coupland as Abie (but why should I plug that painter). The night went by awfully fast, especially for the horizontal bar-tenders — a good thing we had Pringle to substitute. What was McNiven doing beside the road? And why should Proctor go to bed so early? I still remember Buzz sleeping on the beach.

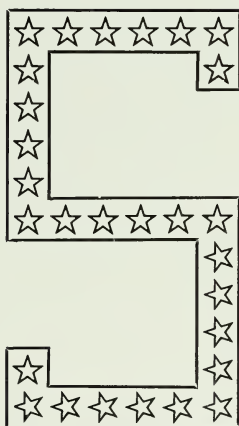
By the looks of the boys Saturday morning the party had been a real success. But with tourists departing, Deer Lodge out of bounds and exams pending things quietened down till our next social event. This could be called My Nightmare but is more commonly referred to as the Party. Some say it was a success too.

PETE AND URB.



Graduate's Album

4T3



Engineering Society

THE UNIVERSITY OF TORONTO

FOURTH YEAR CIVILS



Third Row: M. J. AYKROYD, D. G. MACLEAN, J. E. STANNERS, D. S. CHAPPELL, J. A. McKECHNIE, R. WELLER, P. ONASICK,
D. OLDRIEVE, F. NEAR.
Second Row: D. E. HIEBARD, H. E. ARCHIBALD, R. B. TELFORD, L. RAY, M. CURZON, D. HAMLIN, G. H. WORKMAN.
First Row: PROF. TREADGOLD, DEAN YOUNG, J. G. LOVE, J. A. TOP, C. H. M. SMITH, A. P. ALLIN, D. E. GROSSKURTH,
PROF. LEGGET.
Absent: D. MACKENZIE.

FOURTH YEAR MINERS AND GEOLOGISTS



Fourth Row: J. G. H. HUCKLE, R. A. PRENTICE, H. S. METCALF, J. N. DICKIE.
Third Row: H. E. PERKS, O. B. BOLAND, M. W. DOUGLAS, U. J. CHAPUT, H. F. R. DAVIS.
Second Row: J. S. HAMILTON, T. R. MORTON, J. M. FERGUSON, W. A. GOW, J. GIOVANETTI.
First Row: L. PANCER, J. T. KING, C. G. WILLIAMS, S. E. WOLFE.

FOURTH YEAR MECHANICALS



Fourth Row: A. L. THOMAS, G. O. MILLER, A. I. CHEPKIN, A. KOOST, M. A. CAPPER, R. R. BROOKS, W. H. CRAIG, H. E. FARINTOSH,
 J. H. E. WEBB, M. PRITZKER, A. T. GHARD, R. S. WILLMOT, M. H. STREN, D. TIDY.
 Third Row: R. A. WALKER, D. H. DUCKWORTH, A. P. KENNEDY, J. M. VALLANCE, R. R. ASSELSTINE, D. G. DARLING, P. S. DEWAR,
 W. A. MOESER, T. N. CHRISTLAW, R. P. J. BYRNES, D. H. ISBIESTER, B. O. DICK, T. A. JULL, R. C. HENDERSON.
 Second Row: C. H. TOWNSEND, R. R. SERVICE, J. R. SHIRES, D. P. McVANNEL, L. F. C. PEPINO, S. J. WHITAKER, H. A. PHILLIPS,
 G. L. S. BIGGS, D. J. MCCHESENEY, J. S. FORRESTER, A. J. S. LEWIS, M. V. JONES, E. R. DIXON.
 First Row: J. M. DVYKE, PROF. D. D. PANABAKER, PROF. R. C. WIREN, PROF. E. A. ALLCUT, PROF. R. W. ANGUS, PROF. W. G.
 McINTOSH, PROF. G. R. LORD, I. W. SMITH, B.A.Sc., J. P. G. GORDON.
 Absent: R. M. ALLEMANG.

FIFTH YEAR ARCHITECTURE



*Third Row: PROF. ARTHURS, PROF. CARSWELL.
 Second Row: ADAMSON, MISS J. TAYLOR, R. FAIRFIELD, K. CAMERON, G. E. MORLEY.
 First Row: J. M. CHARLES, J. MURRAY.*

FOURTH YEAR ENGINEERING PHYSICS



Third Row: J. HENRY, R. A. MULLER, K. HUNTON.

Second Row: I. R. LOUNSEURY, J. L. SHALES, W. S. MISNER, W. CHEESEMAN, H. A. REID.

First Row: W. A. COLE, PROF. K. E. JACKSON, G. A. G. DIACK, R. E. VALE, V. G. SMITH, R. E. SCOTT.

FOURTH YEAR CHEMICALS



Sixth Row: W. E. BESSANT, G. D. ZIMMERMAN.

Fifth Row: H. V. PAGE, R. G. SILVERLOCK, O. L. TURNER, L. S. DAWSON, D. DRAPKIN, H. W. ASHTON.

Fourth Row: D. CRAIG, C. H. HEYS, L. J. LENNON, M. S. GREEN, D. W. MARSHALL, W. J. PACHELLO, R. C. WORKMAN, M. S. W. SMALL.

Third Row: E. C. DOIDGE, G. J. LYSAGHT, G. F. HONSEGER, L. G. HINTON, P. M. REILLY, H. MORAWETZ, P. S. H. CRAIG, M. C. CRAWFORD, D. E. KEENAN, H. M. DRAPKIN, R. H. WRIGHT.

Second Row: PROF. SMITH, J. W. SZYMASZEK, MR. FITZGERALD, R. M. RICHARDSON, MISS E. C. JONES, L. A. ZELLAR, A. G. LAMONT, MISS A. E. RUSHBROOK, C. M. SMITH, S. A. G. SINGER, B. T. JOHNSON, R. F. LEWARNE.

First Row: MR. A. HUNT, MR. MACELHINNEY, PROF. BRECKENRIDGE, PROF. BAIN, MISS BURKETT, PROF. McLAUGHLIN, MR. WILLIAMS, Absent: A. W. MORGAN, R. C. QUITTENTON—on Active Service.

FOURTH YEAR ELECTRICALS



Fourth Row: R. L. ADAMS, H. M. WILKINSON, W. D. SMALL, E. W. LAVER, D. H. COOKE, A. G. DAY, W. E. HODGES, R. W. NAYLOR, J. M. HAM, E. F. BUCKLEY, L. W. ORR.

Third Row: H. E. GRAHAM, D. W. PORTER, J. K. ALLEN, A. J. DINNIN, R. K. PILE, G. E. DAVIDSON, G. H. MEYER, K. R. STOCK, C. MARCHANT.

Second Row: P. CLARKE, W. J. INKSTER, E. M. NYLIN, P. HUMENIUK, F. O. HPPWELL, K. BINGHAM, F. P. SHAND, E. A. GOODHEAD, H. J. CRAWFORD, P. L. DANDENO.

First Row: W. McCOWAN, Mr. R. G. ANTHES, PROF. R. J. BROWN, PROF. H. W. PRICE, PROF. A. R. ZIMMER, PROF. V. G. SMITH, DR. F. NOAKES, G. M. NIXON, P. D. SMITH.

FOURTH YEAR METALLURGISTS



Third Row: E. P. HARRISON, A. G. RANKIN, H. D. FORBES, B. CHALET, G. K. CLEMENT, D. E. HOUGHTON.

Second Row: F. M. AIMONE, E. R. FROST, R. H. NEAME, J. H. ARCHER, D. H. ROSTRON, J. B. MITCHELL, J. K. SWINTON, F. D. ISBISTER.

First Row: H. ROSS, A. FRUMKIN, PROF. J. E. TOOMER, PROF. G. A. GUESS, PROF. J. A. NEWCOMBE, F. W. KELLAM, G. R. HEFFERNAN

CLASS OF 4T6

A freshman year unequaled before entered the Faculty in '42. A group of men six hundred strong chose the engineering profession as their objective.

We were instructed and well advised by Dean Young and colleagues in turn and often reminded that we were a privileged group. War conditions as well as our large enrolment contributed to the small initiation festival provided by sophomores. Cautiously we surveyed the situation and gradually settled down to the life of a Schoolman.

Our formal invocation of the Freshman Banquet with the Toike Oike and the School songs brought in the School spirit and pepped us on. The Soph-Frosh followed midway in the fall term picturing Sophmores and Freshmen at their best.

Something new and drastic struck fear into the Freshmen with the announcement of a formal examination at the end of the Fall term. New because it was a war measure. Drastic to the freshmen for they had so much to grasp in so short a time.

January, the beginning of another year, brought us out in a blaze of glory. Our New Year's Party and the great School-At-Home made the month socially complete.

School-Nite, the highlight of February, with the extravaganza of six bands brought us out in hundreds.

Ending the social gatherings came the class party in March where dancing was the feature attraction.

Perhaps it is hard to visualize the material in every kind of endeavour which was imminent in our number. Much of it was realized in the sport activities and co-operation for School but a large quantity of talent lay dormant due to our large number, the pressure of studies and heavy atmosphere of war. It is felt by many that in our sophomore year we will burst forth in efforts more truly proportional to our number.

4T6, a great class, will gain in esteem and power as it advances through to the final year and graduation.

To those of our class who have left, we wish every success.

Al Klassen and his executive take over a happy job and we who are bowing out wish him every kind of success.

K. H. SHARPE,
President.

4T5

No one will argue, except a man in jail, when you say, "tempus fugit". It seems, however, that this year old "tempus" wasted little time in "fugiting" because a retrospective analysis of the year's activities reveals that old man really raced during the last six months. When we think of the "Grim Reaper" lazing around during the autumn months, knocking the leaves off the trees onto the herds of Frosh bristling about in their green cravates, and then think of the "Grim Boy" poking his head out from behind April on the calendar and giving us a glimpse of his nice sharp scythe — we shudder. Nevertheless, he's watched us go through a good year, socially, financially (for the executive) and for those who did their best, academically.

He watched us initiate the Frosh, albeit we were timid due to remonstrations and warnings, we gave them a taste of what the good old days were like. Next year it is planned to use Varsity Stadium and make a real time of it getting it out of our system for good. The Reaper saw us at the Freshman Reception where 385 of the boys came out to hear Col. Wilson's excellent address spiced with his own reminiscences of college days. The reception had a bang up programme of magician, skit by Wm. Neale and Company, Duke Rigby and his coloured comets, pie eating contest, sing-song and refreshments. We modestly admit that it was a good show, establishing a precedent for high entertainment value and record attendance.

Our next show was the big Soph-Frosh in early November when Jack Evans and his boys played at the Royal York the same night as the Meds at Home with Morgan Thomas. That was truly a night for the books, Schoolmen and Medsmen on the same floor. The result? A draw.

When the snow lay round about and the Reaper had donned his red outfit with the white trimmings and bells, we had the best time of the year at Casa Loma. Just before Christmas, free cider and doughnuts, Christmas presents for all the Professors, five, count 'em, five Santa Clauses and the Modernaires band. "Bull" Ritchie did the job of head Santa Claus and kept the party in mirth the while with his native witticisms.

The Junior Soph-Frosh developed into a buck passing affair but the three years finally got going and on February 18th, at the King Edward Hotel, Paul Firman making with the cacaphony, we joined with 4T6 and 4T4 and shuffled around for several

hours. General repute had it as one of the lesser affairs but it was enjoyable in its simplicity.

The social functions wound up at the Arcadian with a sparkling little year dance, about 100 in attendance; Stan Patten's excellent band kept a lively crowd jumping all night.

As it was the evening of the elections, posters and streamers salvaged from the schoolhouse decorated the hall and the general spirit of things was typical of election day.

Several of our boys donned the khaki during the fall. Galt Smith, Rick Tolman, Ruliff Grass, Rod Howson, Tippy Williamson and all of them are now sporting the shiny things on their shoulders. Many other personalities grew in fame this year. Jack Stafford, ace of the ice-land, "Streak" Gibson and Gord Wallace. Steve's basketball wonders, Bud Smith—assistant sport editor of the *Varsity*, and many others who did deed of merit, make us proud to be their contemporaries.

But we mustn't forget the "Reaper", he is waving those exams at us and by the time we are working this summer we will know about how close his blade came to nicking us. We wish every one in 4T5 sincere good luck and hope that circumstances see fit to allow you to return next year. Your affairs will be handled by Messrs. Stuart, Wallace, Currie and Spence while two of your present executive advance to Second Vice-President and Treasurer of the Engineering Society.

Au revoir, we hope.

PETE AYKROYD, *President.*

ED PEACOCK, *Vice-President.*

BOB MOORE, *Secretary-Treasurer.*

DON GIBSON, *Athletic Representative.*

4T4

Hello again, fellows! A quick backward glance over the past school year reveals that it was a successful one. The spirit of the class has been one of seriousness and the equipping of ourselves mentally to the best of our ability.

But as in the past, our spirits have been kept buoyant by class functions. The first dance was held in November at Casa Loma. The location plus the Modernaires spelt success in great big capital letters. This was closely followed by a combined party with 4T3 at the same location with the same band on the day before the end of the fall school term. Santa Claus added to the festivities by bringing a few little gifts to our professors. The final class dance was held shortly after School-Nite at the Crystal Ballroom in the King Edward Hotel. Both 4T5 and 4T6 shared the evening with us and many a lad voted Paul Firman's band tops for the music department (does anyone know where the zoot suited cutter went too?)

But not only class functions received 4T4's attention. School dinner saw our class seated in huge droves waving their ration cards. Too, at the School-at-Home, 4T4 was first to arrive and last to leave. Mart Kenny's orchestra played many a request for our lads. Then to round off a perfect year, we attended School-Nite and danced to everything from sweet and hot to corn in the loft. Many of our fellow classmen are still seriously contemplating to adopt the mermaids for our year.

Well, that's about all that can be said in revue. But this year's executive would like to add a thank you to one and all for your whole-hearted support in the past. We remind you that next year is our graduating year. So in the same manner, get behind next year's executive. They're a grand bunch of fellows, and will guide the interests of the class to new heights.

Your President,

JACK WARD.



G. WORKMAN
CIVIL CLUB



O. TURNER
SECRETARY-TREASURER



R. A. PRENTICE
VICE-PRESIDENT



J. N. DICKIE
PRESIDENT



K. V. GOW
ATHLETIC REP.



F. W. KELLAM
MINING & METALLURGICAL CLUB



J. A. MURRAY
ARCHITECTURAL CLUB



J. M. DYKE
MECHANICAL CLUB



R. FLEVARNE
INDUSTRIAL CHEMICAL CLUB



P. D. SMITH
ELECTRICAL CLUB



J. A. DIACK
ENGINEERING PHYSICS CLUB



R. E. SCOTT
DEBATES CLUB

FOURTH YEAR EXECUTIVE

Faculty of Applied Science
and Engineering

UNIVERSITY
OF
TORONTO

1942-1943

*Published
1942*

4T3

And now that within another couple of months we will be just another bunch of graduates, let us look back over the past four years briefly.

In our first year Jim Cawley held the reins and got us all away to a flying start on our new adventure. That year we got a taste of University life as it normally was, with intercollegiate football, hockey, basketball, et al. Combined with these was the annual hazing of the frosh and lots of all round good sport.

Our second year came and with it more restrictions due to the war. Sports were cut but more and bigger dances were held with big Bob Scott in the driver's seat this time.

In third year, Bill Moeser took over and eased us into our last and final year with a fair bank balance which we added to and now on the eve of our "Grad Ball" things look rosy for a super evening.

So in closing, gentlemen, we can, I believe look back on our "School Days" with pride and say that we did our share to keep the "Spirit of School" alive.

Now as the final curtain rings down with the Kipling Ritual and we start on another journey let us always remember the members of the Class of 4T3 and be always willing to lend a hand. God bless you, cheerio, and keep your chin up!

JIM DICKIE.



C. H. MACDONALD
COUNCILLOR



J. H. DYAL
SECRETARY-TREASURER



W. A. FOSTER
VICE-PRESIDENT



H. JACKSON
PRESIDENT



H. MCCAWLEY
VICE-PRESIDENT



J. DICKIE
COUNCILLOR



G. BIGGS
COUNCILLOR



R. FAIRCHILD
COUNCILLOR



R. MILLER
COUNCILLOR



R. QUINTERTON
COUNCILLOR



R. MAXTON
COUNCILLOR



P. MELLAN
COUNCILLOR



J. MAXTON
COUNCILLOR

PERMANENT EXECUTIVE

413

Faculty of Applied Science
and Engineering

UNIVERSITY
OF
TORONTO
1942-1943

*General
Manager*

PERMANENT EXECUTIVE 4T3

The Class of 4T3 has suddenly realized that School days are over. It is with a mixed feeling of anticipation and regret that we realize that our four brief but happy years at S.P.S. have come to an end. We, the first real "War-Babies" look at the past years in retrospect, recollecting the many friendships and experiences we have enjoyed since the eventful days of September, 1939. Few of us will forget any of the past four Septembers, initiated, initiating, reinforcing and observing. The years spent at School have been filled with never-to-be forgotten incidents, and it is the intention of your Permanent Executive to keep in touch with all members, as well as to afford a means by which members can keep in touch with each other. However unless each and every member co-operates with the Executive their task will be hopeless.

The Executive will maintain a record of names, addresses and occupations of all the graduating class. At the moment it is very difficult to surmise where any of us will be in two months. It is imperative that John Dyke, our secretary, knows the location and position of each man as soon as possible. Information will always be available from the secretary or your departmental councillors. News of interest will be provided by a circular letter and through the "University of Toronto Monthly". Your Permanent Executive is only too willing to work for you. Write to them about your ideas; about any information you require; or just for old time's sake.

We ask you to co-operate with us and the U. of T. Alumni itself to maintain the "Spirit" of the University and of the School and the "Tradition" of the Class of 4T3.

May good fortune and happiness be yours throughout the coming years.

President: M. J. AYKROYD,
9 Garfield Avenue,
Toronto.

Secretary: J. M. DYKE,
88 Woodside Avenue,
Toronto.

HY. 5924.

LY. 8136.

GRAD BALL

This year, as last year, the Graduation Ball of 4T3 was held in the King Edward Hotel. Mart Kenney supplied the music from 9-2 and supper was served at 11:15. Entertainment was supplied and the usual presentations were made. The Dean accepting a pack of playing cards and Professor Legget a prop of ill repute.

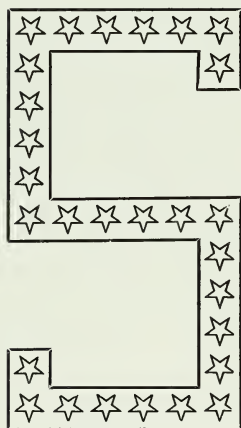
And now that it's over, we have something to talk about along with those years who have gone before us and invariably showed up late one morning in March, with baggy eyes and haggard features, with no intentions of doing any work but just to see what the other fellow looked like, and to talk over the night's fun.

Be as it may, it has come and gone and with its passing goes a sight of regret for there was the end of all the social functions for the class of 4T3 for it is a great improbability that we shall all be together again.

But the memory lingers on.

School Athletics

1943



Engineering Society

THE UNIVERSITY OF TORONTO



W.G. HENRY
SECRETARY-TREASURER



H. DE COSENTINO
PRESIDENT



F. SAMPSON
VICE-PRESIDENT



K.V. GOW
4TH YEAR REP.



D.W. PRINGLE
3RD YEAR REP.



D. GIBSON
2ND YEAR REP.



H. BOYNTON
1ST YEAR REP.

ATHLETIC ASSOCIATION EXECUTIVE

Faculty of Applied Science
and Engineering

UNIVERSITY OF TORONTO

1942-1943

*Spedland
Toronto*

ATHLETIC ASSOCIATION

In the year of nineteen hundred and forty-two,
With little or nothing better to do,
The Hart House Hackers with sinister laff,
Cut School of Science points in half.

At first School put up a fearful stink,
Then the Association began to think,
No use to beef, here's a problem to face.
How can we win the T.A. race?

So, School came up with a brand new whim
The results caused MacCutcheons head to swim.
Thus, was born School's mass production
Sixty teams were formed, by slight induction.

But School lost the race by a thin red hair,
The reason was, well, "c'est la guerre".
This year School decided to try once more,
To get the Trophy, to grace our store.

Congratulations men, and have no fears,
The Trophy has returned to the Engineers,
You "dood it" fellows, you were hot,
A pat on the back and thanks a lot.

Well enough of that padding men. School has had some great teams in there sweating this year, we have won more than our share of championships. There is no telling what next year will bring, but one thing is certain, that the spirit and fight will never be lacking in any S.P.S. team. So men, get in there and fight next year, and good luck.

DON GROSSKURTH,
President.



BRONZE "S"

This year S.P.S. has awarded to Don Grosskurth its highest athletic honour, the Bronze "S". This coveted award is presented each year to the Schoolman who during his career at S.P.S. has displayed outstanding athletic ability, leadership and sportsmanship.

Don's interest in School sport has been evident since the first year. In that year he was elected as athletic representative. The following year as Vice-President, then secretary-treasurer and finally President of S.P.S. Athletic Association.

Don has been active in a great variety of sports. During his four years at S.P.S. he took part in rugby, hockey, baseball, basketball, lacrosse, golf and wrestling.

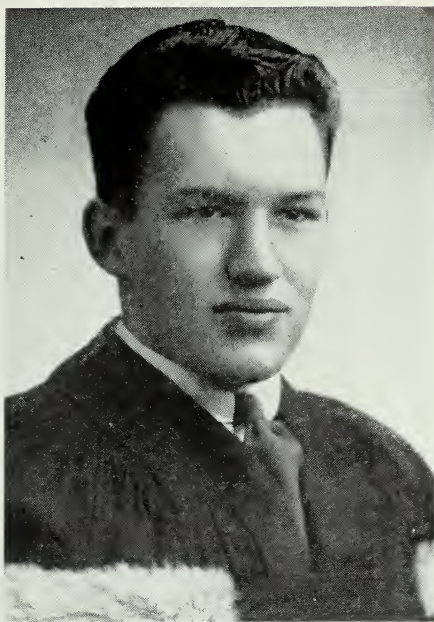
In his first year, Don was captain of the S.P.S. rugby semi-finalists. A member of the Junior S.P.S. Championship Hockey Squad and a member of the lacrosse and wrestling teams.

In his second year he again was captain of the Junior S.P.S. Championship Rugby Team. A member of the Junior Baseball and Junior Hockey and Wrestling teams.

In his third year, Don took part in all sports for which he could possibly make time.

In his final year he again played with a vast variety of School Teams and as President of S.P.S. Athletic Association showed his worth as an organizer.

Schoolmen of all classes say "Well done Don, may your success continue in the future as an athlete and as an Engineer."



PHENE MEMORIAL TROPHY

This year Weed Quittenton was awarded the Phene Memorial Trophy. Voted the holder by his fellow Senior School Rugby teammates.

Weed has played a prominent roll in S.P.S. rugby, giving his full time and energy.

He is a great sportsman and leader and his chatter along the line kept the Senior Team in there plugging when things looked darkest.

Congratulations, Weed; may your leadership and spirit carry on at Brockville and wherever you may be as a member of the Royal Canadian Engineers.

SENIOR FOOTBALL TEAM



Third Row: J. G. LUCAS, J. H. WEBB, J. PLAXTON, K. GOW, D. GROSSKURTH, D. HAMLIN, R. SEYMOUR, R. WORKMAN, J. BRENNAN.

Second Row: G. WORKMAN, H. PAGE, H. PETERSON, S. GRAHAM, A. SHAMIS, W. HENRY.

First Row: K. O'DONNELL, G. BIGGS, D. WALLACE, R. MCINTYRE, D. ZIMMERMAN, R. QUITTENTIN, B. WHITE.

SENIOR SCHOOL FOOTBALL

Once again pre-season favourites, Senior School Rugby team started into the interfaculty pigskin competition. A well balanced and experienced backfield coupled with a hard charging line gave promise of bringing the football championship back to School.

On a muddy field, School outfought their old rivals, Victoria, to gain a close 6-5 decision, made spectacular by "Turk" Grosskurth's 55-yard run for a touchdown.

The highly touted School fell next to the tune of 6-4 in a game of kicking and passing duels.

Senior Meds, always tough opposition, nearly pulled an upset but School came through to win 3-1 on a 35-yard placement by Ted Webb.

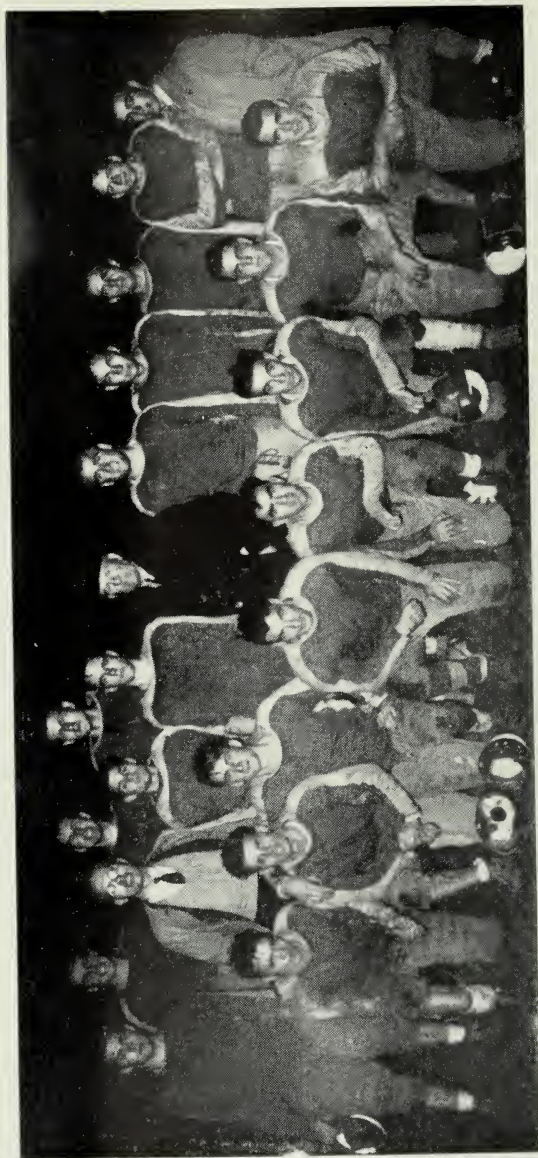
With Grosskurth out for the season with injuries, and suffering the usual mid-season letdown, School fell before Victoria 13-0.

Junior School again took the short end of the score 3-0 on a muddy field. School completed the schedule in first place and entered the play-offs against U.C.

The game was played on a field which was covered by sheets of ice and water. Under anything but ideal conditions, it developed into a game of breaks. Using poor judgment in the pinches, School fell before U.C. 6-5, to wind up a season of hard clean fought football. The season was highlighted by the vicious tackling of "Weed" Quittenton, the steam roller plunging of "Mac" McIntyre, and the all round play of a line which wouldn't say "die". If, and there is always an "if" for losers, we hadn't lost the mighty quarterback, Plaxton, to the Navy, I'm sure it would have been a different tale to tell.

GEORGE WORKMAN,
Manager.

JUNIOR FOOTBALL TEAM



Second Row: T. WALDON, R. RITCHIE (*Manager*); J. NEWHOUSE, J. BROMLEY, MIKE RODDEN (*Coach*); P. CROSS, K. CRAIBBE,
 A. McCONVEY, G. BOA, S. COOPER (*Assistant Coach*).
First Row: G. EANS, A. GLOVER, W. LAWRENCE, W. MOFFAT, W. SHARPE, K. SHARPE, L. BROUSE, H. SPENCE.

JUNIOR SCHOOL FOOTBALL

Outlucked but never outfought, School Juniors went through an unblemished season, with not a spot on their record, nor a victory.

In the early fall, the team loomed as a possible Mulock Cup winner, however, such was not the case. Despite alibis for every loss, suffice is to say that the boys played their hearts out for dear old School. Last minute defeats after leading throughout the game, a 1-0 defeat and the loss of Herb Stricker after the second game, certainly did not help the cause. Nevertheless the boys were in there, trying to the bitter end.

The line never backed up an inch, Jimmy "Pride of the Maritimes" Bromley, the Sharpe boys, Walt and Ken, Doug Currie, "Hard-Rock" Sweeny Cross, Al McConvey, Bill "Amphibious" Moffatt, Bob Riddell, Chunky Newhouse, Leo Brouse, Al Glover and Gil Boa always gave their best.

In the backfield top-notch efforts were turned in by Herb "Call Me Fragile" Stricker, Tommy Waldon, Jack "Slugger" Stafford, our pro, Jackie Maclean, Ken Craibbie, George E. Evans, Harvey "Broda" Spence, "Sprinter" Vern Booth and Bill Lawrence.

Mike Rodden handled the coaching duties, seconded by Syd Cooper. Both were distrustingly watched by Rod Ritchie. Mike, Coop and Bull deserved a better fate but such is life.

On individual merit the boys stood out as did no other team in the group. Stricker, Booth, Gus Campbell, Cross, the Sharpe boys and Glover can wear cleats with the best of them. One lad who shone brilliantly both ways was Triple-Threat Bill Lawrence, an all-star from Runnymede. He left us to join the Air Force in December so Hitler, etc., better duck. A pluckier, gamier kid than Bill never wore the blue and gold. How Bill missed the all-star team is something the boys are still trying to figure out.

Come the fall of '43 — we have the talent — we'll get a winner. It can be done. The Little Red Schoolhouse longs for the Mulock Cup.

SENIOR SCHOOL HOCKEY

After a slow start the Senior School Hockey Team began to show its true form. With a minimum of effort expended, School worked their way into a good play-off berth against Senior Meds, by winning four and losing four.

The first line of Dickie, Douglas and Maughan, showing an abundance of speed and playmaking ability still had difficulty in outshining the hard checking second line of Grosskurth, Workman and Kelly.

Hamilton, Moeser and Quittenton did trojan work on the defense, shorthanded as they were due to absence of Hal Seymour through injuries.

Workman in the nets was in a class by himself and made the opposition perform acrobatics to get the puck past him.

School split even with Vic, and St. Mike's, lost twice to U.C., and defeated Dents twice to complete their schedule.

If School is successful in defeating Senior Meds, they will go into the finals and take on the task of bringing the Jennings Cup back to S.P.S.

J. PLAXTON,
Manager.

III HOCKEY

This year School Thirds, composed mainly of third and fourth year men, was grouped with the two Meds' teams and Junior School.

The games with Meds were close and hard fought with School collecting one win, a tie and two losses. Junior School with more class and speed were victorious in both their games and finally wiped out our last playoff hope.

To fill the goalie's position Frank Kellam was persuaded to come out of retirement and turned in an excellent performance.

On defence, Joe Giovannetti and Johnny Iglesias, members of last year's squad, teamed up to form the first string rearguard, with Big Bob Seymour and hard hitting Pete Gordon giving ample support.

Up front Mac Baker and Lloyd Kauffman, two promising juniors, worked smoothly with Duff Dixon, another senior lured from retirement. The second line was built around the experienced Ken Cameron at centre, Brian White on right wing and yours truly on left.

JOHN BRENNAN,
Manager.

JUNIOR HOCKEY TEAM



*Second Row: H. Boynton, J. Lucas, J. Dickie.
First Row: P. McDonough, A. Ridler, D. M. Foulds.*

JUNIOR SCHOOL HOCKEY

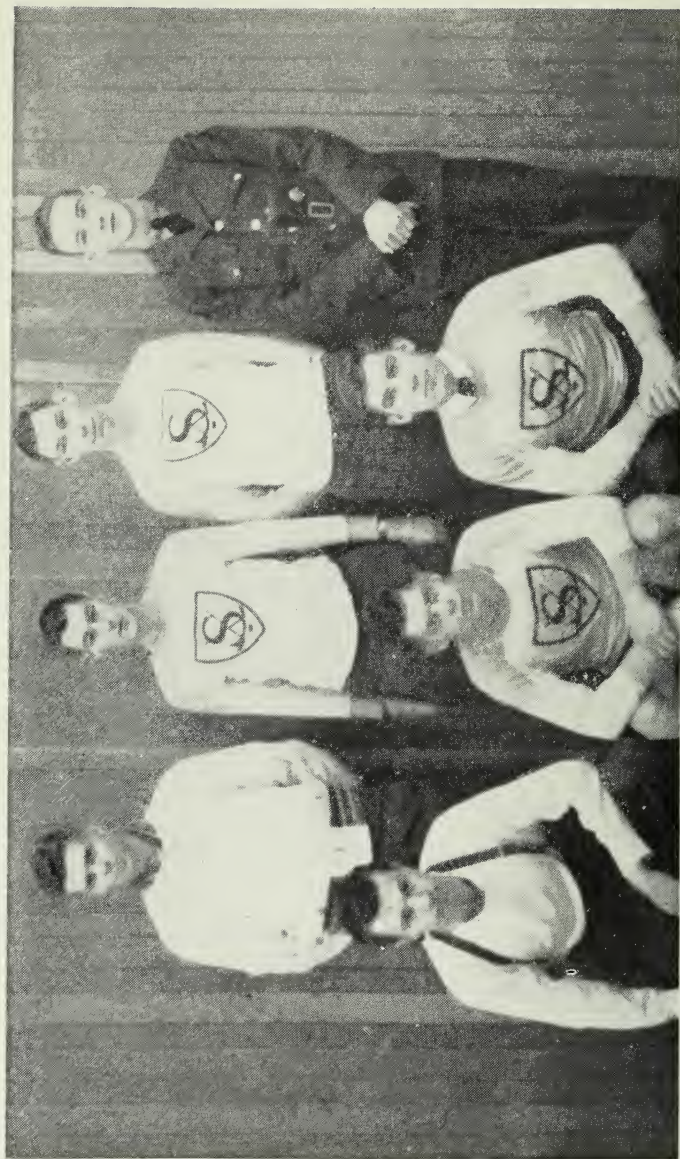
With only one more game to play, it looks like the Juniors are in the playoffs again, and this time with what appears to be a stronger team than last year. The heart of last year's team is with us again this year in the form of Ball, Ridler, McDonnagh, Boa, and Spence. Besides these we have as the remainder of the team, what appears to be one of the best bunch of freshmen hockey players to come in for some time.

Ratcliffe and Ridler on defence hit them hard and often and can rush. Bill Houston, Harry Boyndton, Fuzz Foulds and Gord Carrol make up the completed forward lines and are all hockey players.

If Junior School does not win the cup again and produce at least one-quarter of the all-star lineup, someone is prejudiced.

JIM DICKIE.

IV HOCKEY TEAM



Second Row: SHAW, DAVIS, YOUNG, McDONALD (Manager).
First Row: J. A. FARLOW, WALLACE, D. HONEYMAN.

IV HOCKEY

At the end of this season's schedule we look back over the accomplishments of the School's Fourth Hockey Team. Placed in the same group with Trinity, U.C. 2 and Vic 2, we started off the season, slightly leery of the Apps-coached Trinity aggregation, which had had itself denoted from the company of Senior School.

The defeat of 10-1 handed to Vic 2 gave us more assurance to meet Trinity. It required the first period, however, to erase the nervousness, and produce a little organization. The second half saw the Trinity goalie kept very busy, but we were unable to overcome their lead and finished the game on the low end of a 5-2 score.

The game with U.C. 2 saw us short-handed, with only seven men, all of whom fought nobly, and we were only defeated by a late score 3-2.

Vic 2 were defeated again 5-2; Trinity, this time, was handed a real score, managing only to scrape a 1-0 victory.

The game with U.C. 2 had no bearing on our group standing, but they were defeated, even with Honeyman in goal for them. The lineup briefly shows:

Wallace—goal. One of the best who came to us from the 3rd.

Doug Honeyman—defence. Versatility is hardly the word to describe him. He ranged from burly defenseman to sharp shooting forward and even played a bang-up game in goal—for U.C.

Bennett—defense. The "sixty-minute" man, playing his second season with the 4ths.

Matt Hannon—defense. Matt never believed in letting the forwards do all the work, but aided them nobly.

Ian Morch—centre or defense. Another versatile player who thought his condition was good enough for a 60-minute man.

Val Stock—defense. Last year's work on the fighting 3rd is praise enough but oh, what condition.

Young—centre. A fast, all-out player from Windsor.

Jimmy Bradford—left wing. The "drummer boy", a fast and determined player who got his share of the goals.

Don Davis—left wing. A good clean player who had the unfortunate knack of testing the boards.

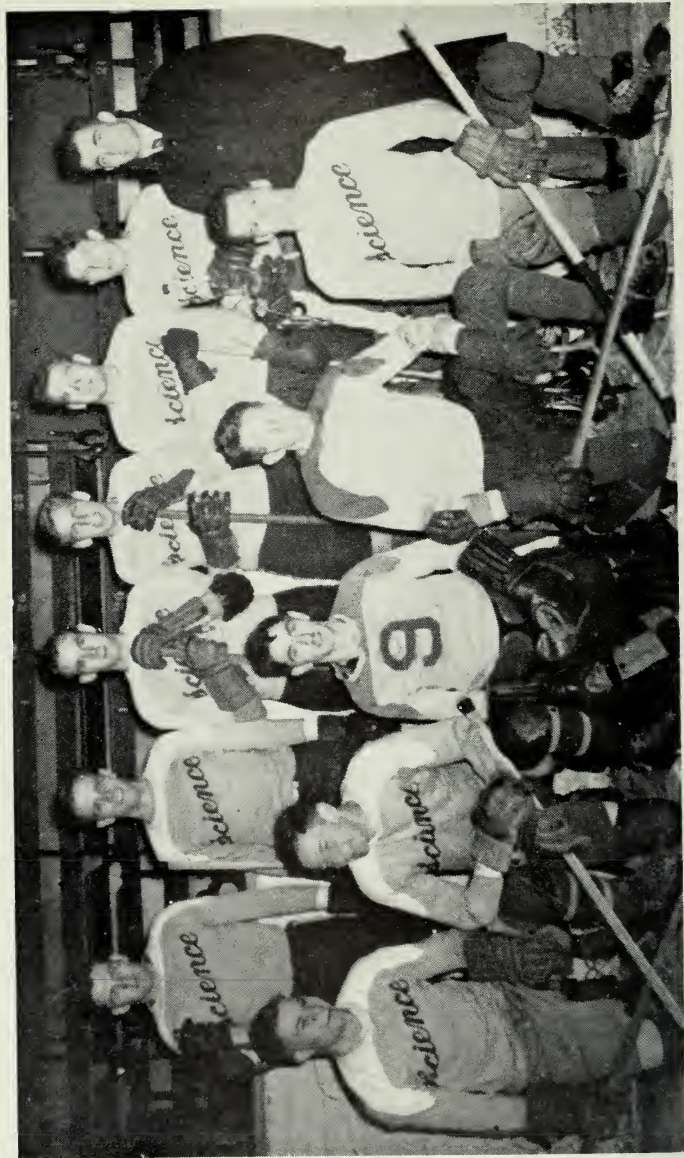
A. Goch—right wing. Another veteran of the 3rd, who always prefers backhand.

George Shaw—right wing. A good man, from U.T.S., who plays his position.

Jack Farlow—right wing. An old hand from last year's team who frequently helped on defense, too.

JOHN McDONALD, *Manager.*

V HOCKEY TEAM



Second Row: J. P. PLUNKET, J. HENRY, J. H. EWING, R. E. ANDER, P. CLARKE, E. E. SUTTON, R. B. TELFORD (Manager).
 First Row: R. MORRISH, J. SPRATT, R. J. THOMPSON, W. MACDONALD, O. B. BOLAND.

V HOCKEY

At the time of writing the Fifth Hockey Team are in the play-offs.

Those who witnessed our first game, in which we were defeated 8-1 by Emmanuel, were no doubt astonished at our later successes. An 8-1 defeat was hardly an encouraging start for the season. The team showed promise, however, and most of the men were sure that with a little reorganization and practice, they could go places.

This belief was justified by the results of the next game in which we turned the tables on Emmanuel beating them 7-0. The reason for this sudden success was the addition to the team of Thompson, a veteran of last year's fifth team, in goal, and Watson as left wing. Thompson did some phenomenal work and was a much needed acquisition. Watson is a very smooth skater and proved to be a great steadying influence to the line as well as a good goal-getter.

We next turned to our other, more formidable opponents—Knox. Knox were reputed to be a hard-hitting team and we noticed with misgivings that they had defeated Emmanuel 11-1. They proved to be great fighters with plenty of stamina exhibited in fierce rushes in the last five or ten minutes. We had our hands full at times but succeeded in defeating them 4-3 in two games.

Sickness and the necessity of making frequent changes has made it hard to keep to a rigid line up.

The team lines up roughly as follows:

In goal, Thompson. At defense, Ewing and Ander, both in last year's fifth, and a hard-working and dependable pair. Ewing is conspicuous for his fast break-aways and Ander for his strong checking and long shots at goal.

Others at defense have been Paul Clarke and Plunket. Clarke is a strong checker and has proved a useful man. Plunket is a most versatile player and has done equally well at right wing and on defense, although neither of these is his real position. Forwards: Morrish, Spratt, Sutton, Boland, Henry and Watson. Also Plunket and Bill MacDonald. Spratt and Morrish played well together, Morrish having a deadly and often effective shot on goal. Sutton is a fast and tricky skater and a frequent scorer. In the other line Boland and Henry make a fast and deadly pair. We haven't seen enough of MacDonald because of sickness. He will doubtless find his place in the games to come.

In general the season has so far been most successful.

R. B. TELFORD,
Manager.

SENIOR LACROSSE TEAM



Second Row: STAN KENT, FRANK KELLAM, IAN CURRIE, JOE PRENTICE.

First Row: BUZZ CROSBY, ART CAPPER (*Manager*), JERRY HEFFERNAN, ART GORMAN.

Inserts: FRANK LEWARNE, STEW GRAHAM.

SENIOR SCHOOL LACROSSE

For the third consecutive year, the Defoe Cup has come to school, under the escort of the Senior School lacrosse team. The team, composed of three members of last year's championship team, was very much the same team as played together as Junior School two years ago. For this reason, the forming of lines was less difficult than it has been at other times. The Frank combination, of Lewarne and Kellam has been together for four years, and the passing and scoring shows the result, as these two did most of the scoring, although the whole team was dangerous around the net.

The team lined up thusly: Kellam, Lewarne and Kent, as one line; Currie, Crosby and Graham as the other. Heffernan was our utility player, and will be remembered as plaguing Monroe enough in our first game with Vic to make him get three penalties. As defence stalwarts, we had Gorman and Prentice, who showed offensive power as well, when the breaks came. In goal was Clapper, who was the best man on the floor, as long as the ball was at the other end of the floor.

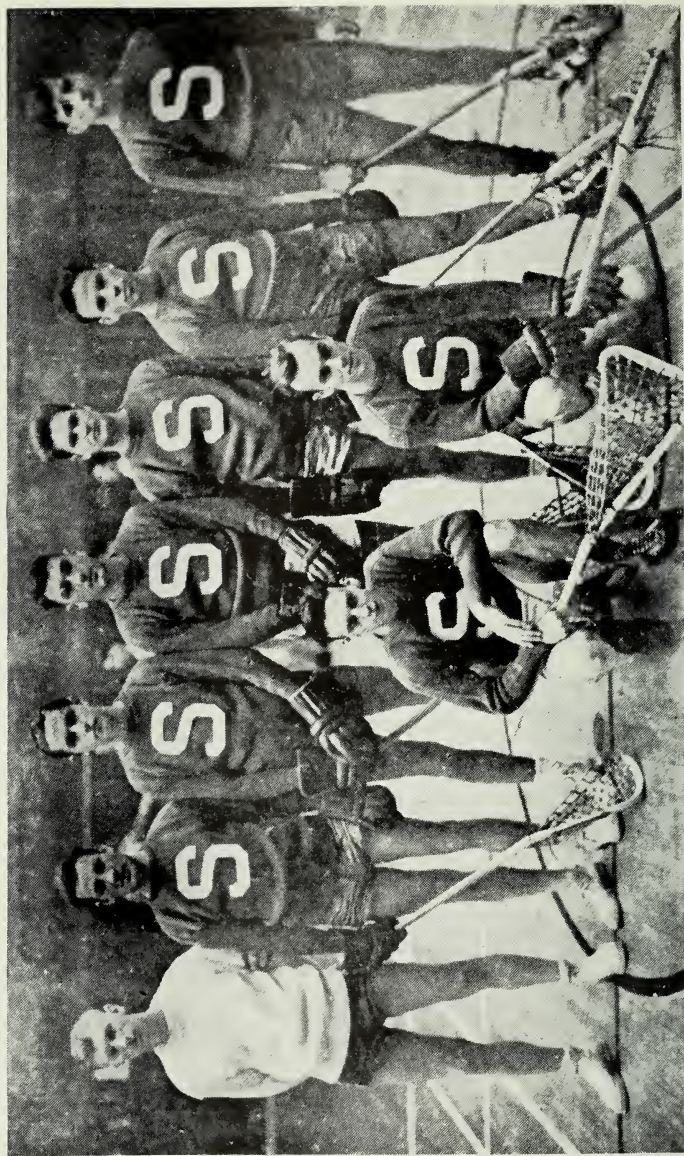
Our schedule began with two games with Pharmacy, which only served to sharpen our shooting eyes, as the lines found little trouble getting through the opposing defense. Vic went down in two close games, 6-4 and 11-7, in which all the team showed up well, although Lewarne and Kellam did all the scoring. We got a bye into the play-offs, and met Dents in the semi-finals. Crosby played his best game of the season, slipping in four goals. We ran into Vic again in the finals, and came out on top, with a 10-7 score. It was a fast, clean game, in which School had to come from behind to win. Lewarne was really on, throwing in 7 goals. Kellam was closely watched, but got in 2 for good measure, Kent got the other. May I add that all the team looked like champions.

Next year's chances look good, as the Juniors have good men to take the place of the five that will leave this year. We're looking for the cup again in the Li'l Red Schoolhouse.

ART CLAPPER,

Manager.

JUNIOR LACROSSE TEAM



Second Row: I. CURRIE, P. McDONOUGH, J. JOHNSON, J. TURNER, W. G. MOOREHEAD, J. J. SCOTT, D. KEARY.
First Row: A. W. STEELE, R. UPPER.

JUNIOR SCHOOL LACROSSE

This year School sported a rugged and classy team that just about copped the laurels.

The team was built around Turner, Moorehead and Keary, three of last year's stalwarts. In goal Steele turned in some efforts that baffled opposing sharpshooters, and he was especially hot as the last of the season and in the play-offs. The defense consisted of Turner and Scott who know how to check; Turner was just as good a high scoring forward as he was a defenseman, having the most goals to his credit. Up front the scoring punch was provided by Keary and Moorehead, aided by Graham, a flash newcomer from First Year. The other line of McDonough, Hull and Upper were the speed merchants of the team who came up with a lot of scoring and checking ability.

The season's record shows the team grouped with Dents, Meds and School Thirds and possessed of a string of six straight wins, although there were a couple of close calls.

Winners of their group, the team eliminated Dents in the play-offs and then ran into Vic in the semi-finals. Vic won this with two goals in the dying seconds of a rugged game that saw Moorehead ejected for his enthusiasm.

The team was well balanced, and spirited and with a little more practice should be sure to repeat for Senior School next year.

I. R. CURRIE,
Manager.

JUNIOR BASKETBALL TEAM



Left to Right: M. CIGLIN, J. TURNER, W. BRANT, C. SCHOCK, M. STEINBERG, M. OSTER,, D. GIBSON (Manager).

JUNIOR SCHOOL BASKETBALL

Having won their group with only one loss, Junior School are now waiting for the playdowns. Since their group was probably the best in the league, the winners should go a long way in their quest for the championship. Many of the games were decided by only one or two points but the Schoolmen seemed to have the ability to throw in that all important last minute basket to give them a victory.

Jim Turner, "Jeff" Brant, "Moe" Steinberg and Murray Oster are the long-geared forwards who carry most of the offensive power. O'Laughlin, Ciglen and Schock are a trio of close checking guards who get their share of baskets.

After losing one game to Meds the team has shown particularly good offensive and defensive power. If they keep up their present hot pace the Juniors with a reasonable amount of luck should be good enough to bring home the silverware.

DON GIBSON,
Manager.

SENIOR SCHOOL BASKETBALL

This year the Seniors had the smallest squad in years but despite that fact we have the play-off gleam in our eyes.

From last year's Seniors we have Workman, Kellam, Parchello and Brooks, Anderson from the Juniors, Van Wyck from the Fourth's and Pringel from Varsity Seniors.

Our group was exceptionally tough this year being made up of Senior School, P.H.E., Meds, and Vic; so far our hopes for the play-offs depend on our ability to beat Meds; after that we hope to see the Sifton Cup.

J. G. LUCAS,
Manager.

SENIOR WATER-POLO TEAM



Second Row: A. J. BRACE (Manager), W. A. PAYNE.

First Row: E. NYLIN, E. J. NORTHWOOD, J. H. DEMPSTER, J. T. BRENNAN.

SENIOR SCHOOL WATER-POLO

The Senior Team this year put up a valiant but vain struggle—vain? You guessed it—but they did beat Junior Meds, a feat which their younger brothers, the Juniors failed to duplicate. For a team most of whose members saw the tank only on polo days, this was really achievement!

Enough of this—now for the team.

The Goalie—Clive Eastwood—his second year in front of the net. Clive had to stop the hardest shots in the league and he really knew where to put the ball after (if) stopping it.

Forwards—Johnnie Northwood—the man who got the ball and knew what to do with it. Support was what he lacked.

Jim Dempster—scored some good goals but should have had (bad luck).

Eric Hall—a terrific shot when he gets it away.

Johnnie Iglesias—another man that knew what to do with the ball.

Ray Byrnes—his first in six months. Played a good game.

Defense—Bill Payne—hard on the attack—sorry defence—when he “dunked” ’em they stayed dunked.

Chuck Rimmer—he scored a goal!!!

Jack Brennan—he really clips ’em.

Eric Nylin—he has played before and proved it.

A. J. BRACE,
Manager.

JUNIOR WATER-POLO TEAM



Second Row: S. PAIKIN, H. SPENCE, W. W. MOFFAT.

First Row: F. SANSON, A. J. BRACE, E. J. NORTHWOOD (Manager), H. G. COLE, D. W. CORNELL.

JUNIOR SCHOOL WATER-POLO

With all the swimmers in School, one would have thought that there would be a Championship Water-Polo team to be had. It seemed that all they lacked was the smoothness of a Championship team and a few more goals. Both could have been obtained if more practices had been attended by the members of the team; but perhaps they can be excused by reason of C.O.T.C., etc. It is too bad that they did not get into the finals or at least into the semi-finals, for they seemed to have the fight that it takes to make a championship team.

Julian Brace: he is one of the best defensemen in the University and can tire any swimmer that he checks.

Fred Sansom: gets the ball at the centre every time he swims for it. He is developing a hard shot and shows vast improvement over last year.

Bill Moffat: alternates with Fred swimming for the ball. He also always gets there first but not always gets it back.

Harvie Spence: has a terrific shot. Drills them in from half way down the pool.

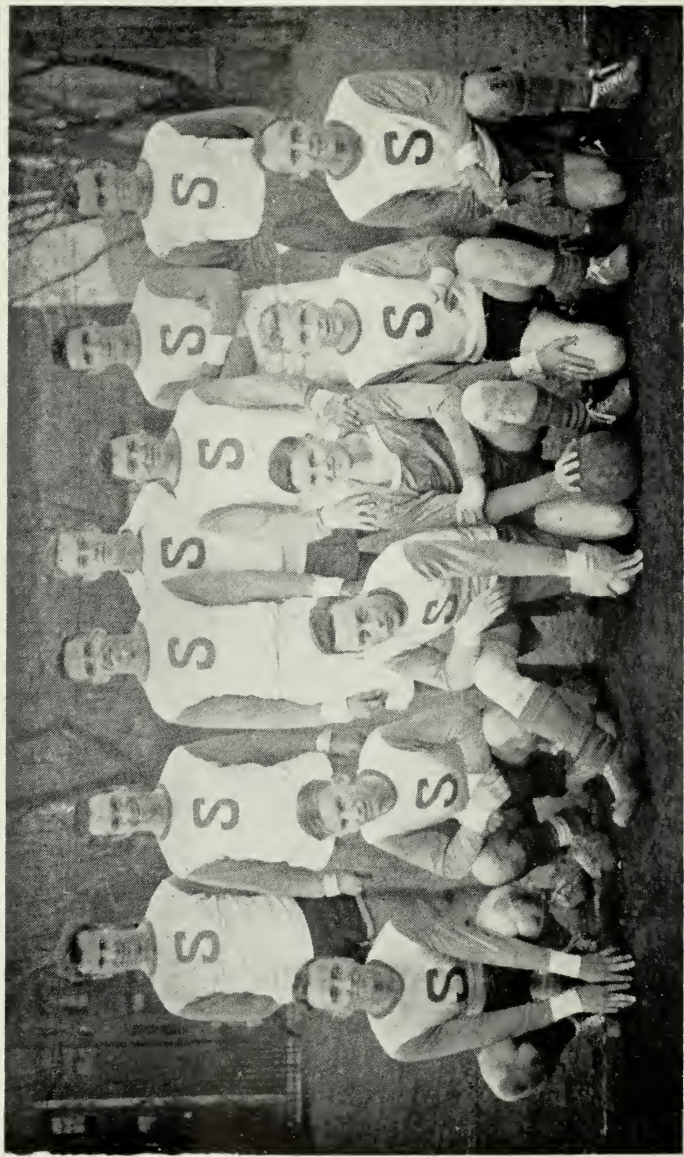
Pete Quentin: a real hard fighter and knows how to set up plays.

W. Brant: his second year as goalie for the Juniors. He is really a good goalie except that he should remember not to try and stop them with one hand.

The rest of the team was made by three freshmen, H. Cole, S. Paikin and D. Cornell, who all showed that they had played Water-Polo before by their tricky ball handling.

E. J. NORTHWOOD.

I SOCCER TEAM



*Second Row: J. R. CLARE, F. H. KNELMAN, H. SEYMOUR, R. MARTIN, H. RIGUERO, R. SEYMOUR, D. MCKENZIE.
First Row: L. A. KAUFMAN, I. CURRIE, A. CAPPER, H. THOMPSON, E. ROBERTS, D. HIBBARD.*

I SOCCER

With our last year's Arts Faculty Cup Winners back at School almost intact, and with one newcomer, it was evident from the opening whistle that the senior squad was on the way to another championship.

Although only six goals were scored by our forward line this year, the team won five games, tied one, lost none. This was due largely to the efforts of Hugh Thompson, who also played goal for Varsity, and who was not scored upon in inter-faculty competition. The season opened with a 1-0 win against Meds. The same score against Vic, a 3-0 defeat of Emmanuel in the play-offs, and the final game on December 12th, with Trinity in the Stadium in the snow, from which we emerged co-champs by a 0-0 score.

Throughout the season, Hal Seymour was the star of the squad, ably supported on the half line by Roberts and Clare. Bob Seymour and Fred Knelman worked very well in front of Thompson. Last year's forward line of Hibbard, Capper, MacKenzie, Currie, Kaufman, Riguero and Martin, was complete again and managed to score on all comers except Trinity.

Since six of us are graduating this year, quite a gap will have to be filled by next year's frosh to keep pace with that set by the last two School Soccer Teams. We want to keep two School teams in the fray, and next year we hope that an all-School final will keep the Arts Faculty Cup in the little Red Schoolhouse.

RAY MARTIN,
Manager.

II SOCCER TEAM



Second Row: A. SANCLEMENTS, R. DENFORD, A. G. DAY, H. CRAWFORD, R. MARTIN, J. McDONALD, E. V. FROST, H. M. WILKINSON
First Row: W. ADAMS, L. TURNER, D. HONEYMOON, E. JUNG, N. GEARY, D. J. MCNAIR.

II SOCCER

With the number of freshmen that turned out this year, we organized the Second School Soccer Team. After its first game of the season, in which Dents were beaten 3-2, the Varsity commented "second in name only". The gang lived up to that reputation by going through the regular season unbeaten, only to lose out to Trinity in the semi-final round.

After defeating Dents 3-2, we tied U.C. 2 all, beat Pharmacy 3-0, then beat U.C. 2-1, took a default over Pharmacy, and tied Dents 2-2, to finish at the top of our group.

The high-scoring forward line was sparked by Doug Honeyman at centre, with plenty of support from Adams, Jung, McNair, Turner, Sanclemente and Day. The half line was centred by little Monk Geary, who sports a very handy head; he was flanked by McDonald, Denford and Wilkinson. Harry Crawford turned out to be a pretty fair goalie, playing his best game against Trinity in the finals. The backfield was ably tended by Ed Frost and Walt MacCowan.

Six members of the Second Team are also graduating this year, which leaves plenty of room for next year's frosh, or any Soccer enthusiasts to come out and play for School. Congratulations, fellows, and we all hope that next year will see that all-School Soccer final.

RAY MARTIN,
Manager.

SENIOR BASEBALL TEAM



Second Row: G. L. BIGGS, D. H. ISBISTER, J. H. HENRY, R. F. SEYMOUR, R. E. AUSTIN, H. H. SEYMOUR.
First Row: W. McCOWAN, A. I. CHAPKIN, J. B. MITCHELL, R. R. BROOKS, T. N. CHRISTILAW.

SENIOR SCHOOL BASEBALL

This year's Senior School Baseball Team was not outstanding as far as the score sheet was concerned, but it in no way disgraced itself. As usual, the Seniors found themselves pitted against the class of the league with such potent aggregations as U.C. and Dents A.

The two requirements for a strong ball team, playing in Hart House, was good pitching and good hitting. We had a good pitcher in Art Chepkin, who could pitch against the best. However, his one fault was the lack of lasting power. Due to the number of teams entered from the Little Red Schoolhouse, we were unable to secure a good substitute pitcher and so, as Cheplin went, so went the fortunes of Senior School.

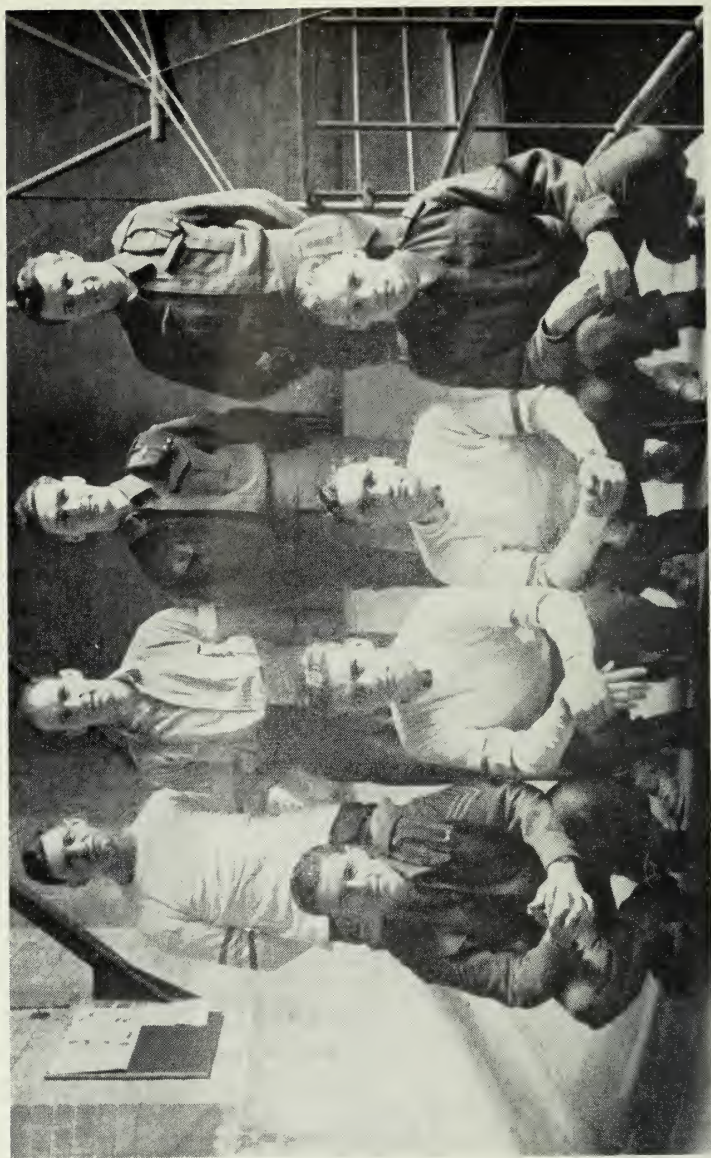
Our heavy hitting department was headed by John "Home-run" Mitchell and featured such sluggers as the Seymour brothers, Bob Brooks, "Nay" Christilaw, Bob Austin and Hugh Forbes. We had a first-rate catcher in Walt McCowan and a good fielding department composed of Don Isbister, Jim Henry and Jack Abell.

We lost our first game to Vic by a 1 to 0 score, and won from them on our second meeting. Against Dents A, we lost the first game 6 to 0, both teams counting 6 hits. In our second meeting, we were nosed out by a 1 to 0 count. Against the powerful U.C. squad we lost both games 8 to 1 and 12 to 3.

Our one hope, as we bow out of the league, is that one of our School teams can weather the pitching of U.C. and Dents and bring the Spaulding Cup down to School.

GEORGE L. BIGGS.

JUNIOR BASEBALL TEAM



*Second Row: H. STRICKER, J. BRANT, P. MASON, J. FARLOW.
First Row: H. SPENCE (Manager), A. SPEAR, S. MOSES, J. C. BOA.*

JUNIOR SCHOOL BASEBALL

At the time of writing, Junior School, one of the strongest teams to come from S.P.S. in recent years, are still in the hunt for the championship. The team this year was picked for its hitting power as well as pitching strength. Herb Stricker, from last year's team is really bowling down the opposition, assisted by Jeff Brant, who also plays in the field, they have been so far unbeatable. Both pitchers have been handled well by Pete Mason, who has caught for the past two years for Junior School.

On first is a newcomer, Jack Farlow, whose hitting and fielding leaves nothing to be desired. The keystone combination of Sid Cooper and Jim Boa is really smooth. Both boys are pounding the apple with great —————. On the hot corner is Sid Moses, who has played good consistent ball for the last two years.

In the field with Brant are two new men, Bill Paisley and Al Spear. These men, chosen for their hitting power, have shown very favourably so far and are being counted on to help bring home the flag.

H. SPENCE,
Manager.

III BASEBALL TEAM



Second Row: D. ZIMMERMAN, W. BESSANT, W. PARCHELLO, B. JOHNSON, E. C. DOIDGE, H. V. PAGE.
First Row: R. WORKMAN, A. W. MORGAN, H. W. ASHTON, R. C. QUITTENTON, T. CAMPBELL.

III BASEBALL

The first game of the series came right on top of the Christmas exams and this, together with the fact that most of the team came straight from a field-trip at Canada Bud Breweries, caused us to drop the game to Trinity by a score of 3 to 2.

The next game was defaulted to us by O.C.E. and then we came up against the unbeaten Pharmacy team, to which we handed a 10 to 1 shellacking.

The fourth game was a return match with Trinity, and proved to be a heated game, going five innings. Parchello saved the day for us by making a triple steal in the last half of the fourth, to tie the game, and in the extra inning we easily pushed over the winning run, to make the score 4-3.

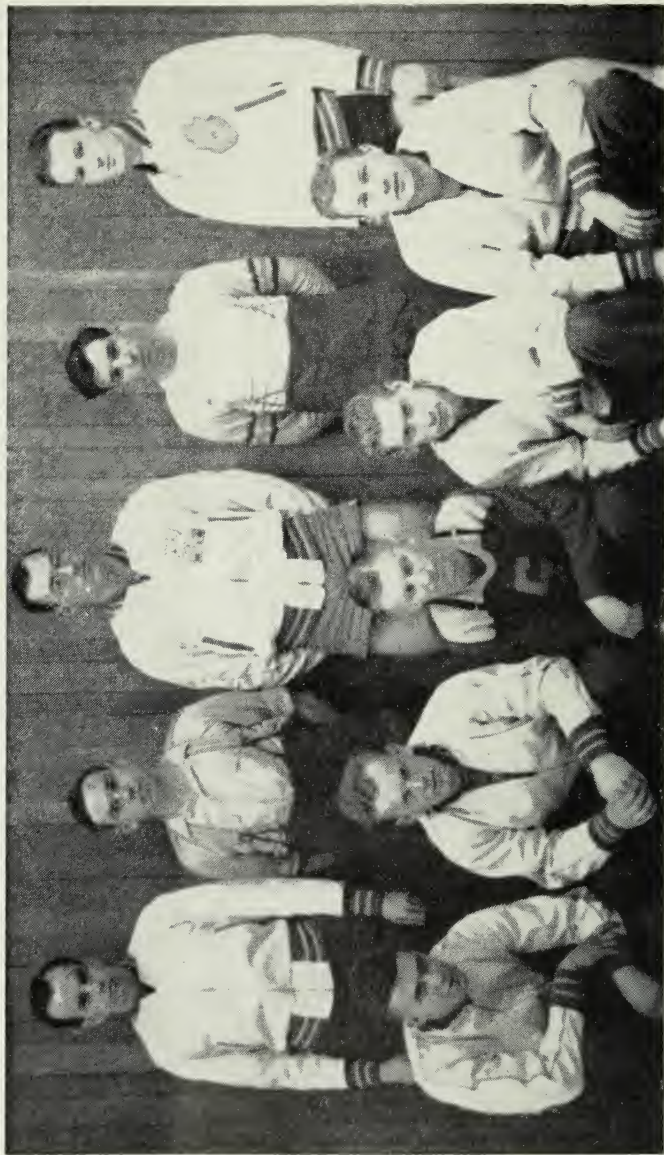
In the last game of the series we blew our chances of a spot in the play-offs by losing to Pharmacy 7 to 5.

Parchello and Page handled the pitching and catching duties respectively, and also supplied some powerful hitting.

The infield was made up of Quittenton on 1st, Johnson on 2nd, and Campbell on 3rd, while Morgan, Workman, Doidge, Zimmerman, Bessant and Lewarne looked after the outfield.

W. H. ASHTON,
Manager.

V BASEBALL TEAM



Second Row: T. W. PROCTOR, B. J. HAYNES, D. W. PRINGLE, W. N. RABEY, H. W. PETERSON.
 First Row: G. SHAW, J. RETTIE, I. R. CURRIE, N. G. McLAREN, A. P. CROSBY.

V BASEBALL

With the exception of the two new recruits, George Shaw and Jack Rettie, the 5th Baseball Team is composed of the second year Mining Team which last year reached the playoffs only to lose by a 1-0 score to Senior U.C. It was a tough game to lose; at the end of the fourth inning the teams were tied 0-0 and in the extra inning U.C. battled home the winning run. This year we should do much better and even predict that ours is the championship team.

At the time of writing the group games have been completed and the playoffs reached. Much credit should be given to our able hurler, Don Pringle, who in the six games played has allowed only seven runs while his hard-hitting team mates have walloped home seventy-six runs. In the line-up Peterson was catching for Pringle, Shaw played first, Currie and Rabey covered second. McLaren was on third and Rettie at shortstop. The outfield was guarded by Crosby and Haynes.

This year there is a particularly good line of pitchers in the league and playoff competition will be keen. In spite of this if the fellows continue connecting as they have been I am confident that the 5th Baseball Team will go far towards reaching the championship.

T. W. PROCTOR,
Manager.

SENIOR VOLLEYBALL TEAM



Second Row: E. NYLIN, D. PRINGLE, J. HENRY.

First Row: J. DICKIE, W. PARCHELLO, D. ISBISTER, N. CHRISTILAW, J. GIOGANETTI.

SENIOR SCHOOL VOLLEYBALL

The Senior Volleyball Team went through all opposition in the Senior group in a blaze of fast spiking by Don Pringle, Bill "Punch" Parchello and Joe Giovanetti, backed by the fine set-ups of Jim Dickie, Jim Henry, Tom Christlau and "Buzz" Crosby. The team was well rounded out by the fine serving of Don Isbister and Eric Nylin, the latter of whom started out slowly as he picked up the finer points of the game but wound up the season with some exceptional set-ups.

The team first met up with real opposition when it played the Wycliffe sextet in the playoffs; but after a hard game the team fought through to the semi-finals. Here, due to the loss of Parchello, one of the best spikers, Senior School gave way to the faster Junior School team. In all, the boys turned in a season which was above all expectations of their manager.

HARRY C. CRAWFORD,
Manager.

JUNIOR VOLLEYBALL TEAM



Second Row: W. BRANT, D. PRINGLE, H. GOLDSTEIN.
First Row: G. WALLACE, H. SPENCE, J. BOA, T. PATTERSON.

JUNIOR SCHOOL VOLLEYBALL

Junior School's Volleyball Team created somewhat of a precedent this year as far as School's endeavours in volleyball are concerned by getting as far as the finals. This was the first time in a number of years that a school volleyball team had gone very far. The team had the proper balance which goes to make up a good volleyball team but lacked experience which proved costly in the final games which were won by Dents. Wallace, Patterson, Boa and Spence were the set-up men while Goldstein, Brant, Hall, Mason and Gibson were the Spikes.

After finishing second in their group the team entered the playdowns and knocked off strong teams from Vic, St. Mike's and Senior School before reaching the finals.

Since this was the first year that many of the fellows had played the game, as a good team does play it, they could hardly be blamed for losing to Dents in the finals since they were the defending champs and had many veterans on their team.

DON GIBSON,
Manager.

TRACK AND HARRIER TEAM



Second Row: A. JACKES, G. LORIMER, T. BARRY, R. FOULIS, KERR, F. LEWARNE, P. ONASICK, F. FORDYCE, D. WILCOX, V. BOOTH.
 First Row: C. MacDonald, W. BROWN, P. McDONOUGH, J. BROWN.
 Absent: J. FELDKANS, W. LAWRENCE.

TRACK AND HARRIER

School has once again dominated the track and harrier scene around Varsity. The season's records shows juicy victories in the senior interfaculty meet (85-25), the novice track meet (66-24), and the senior interfaculty harrier (13-42). In the interfaculty relays Meds nosed us out at the tape by one point, and in the novice harrier—but we don't talk about that.

With freshmen and old colours alike making a well-beaten path around the oval every autumn afternoon, under the masterful eye of Coach Hec Phillips, a potent track cocktail was soon whipped up that put the other teams well under the table. It was a well-balanced squad (all due respect to Trinity's one man gang) with capable men in the jumping, hurdling and weight as well as the ordinary cinder-eating department. Man-of-the-year was Foulis. In his last year with us, Roy crowned his running career by winning the university senior harrier and one-mile championships, and coming 3rd in the 3-mile. The team will miss him a lot next year. Charlie MacDonald was our most prolific scorer in the track meets. Charlie really hit his stride this year and including the interfaculty 440-yard championship, sprinted his way to 3 firsts, 4 seconds and 1 third in the three big meets—not a bad average. We'll miss him too if he doesn't stop haunting the first year draughting room. Vern Booth, Pat McDonough, Wally Brown and Ray Howson all shone in the sprints and combined to make some relay teams that were lovely to watch. In the distance events, ye olde firme of Lorimer-Feldhans (that came 2-3 in the harrier) was joined by freshmen Jim Brown and Frank Fordyce, and along with Foulis took care of everything thrown their way. The high jump featured Kerr, interfaculty champ, with Art Jackes and Frank Lewarne close behind. The latter also won the pole vault for the third year in a row, and got a 4th in the broad jump. In both shot put and discus, Pete Onasick and Dud Wilcox did well, assisted by Lawrence and Barry, who were also in on the hurdles and pole vault respectively. Watts and Lye in the javelin rounded out a versatile field squad.

The standard set this year is something to be proud of and something to aim at. Many man-hours of training have gone into every meet won. If we are going to maintain that standard, I'll see you out on the cinders early next fall.

“PECK”,
Manager.

BOXING, WRESTLING AND FENCING TEAMS



Second Row: LOE RAY, WILL HENRY, DOUG CURRIE, DON GROSSKURTH, D. G. MULLHOLLAND.
 First Row: JOE HEFFERNAN, F. W. MELVANIN, ROD RITCHIE (*Manager*), N. J. GEARY, SYD. COPPER.
 Absent: W. SHARPE, E. N. DAFOE, W. ARTHURS, J. M. TURNBULL, K. GOW.

BOXING, WRESTLING AND FENCING

This year we had all sorts of talent for the boxing and fencing but only the survivors are mentioned below. For the junior assault the set up was as follows:

In the grunting room we had Melvanin and Joe Heffernan in the 135 class and Melvanin looks his weight. In the 135, Turnbull, Lou Ray and Jones. Lou was beaten out by a narrow margin. In the 165 Olson and Arthurs fought it out. Olly said he never had two falls put on him in so short a time. In the 175 Urban and Newall represented School but to no avail. No heavy. The boxing card was heavier, also bloodier than the wrestling but the boys seem to like it that way. Ginsler and Taylor were in the 125 class. "Gins" could really do things next year if he will only turn out.

In 135, Syd Cooper, Dafoe, Geary and Bell. Geary is an old hand at the game and "Coop" put on a show like the Arena Gardens. They did School credit.

In the 145, we had Tamblyn and Harshaw. Harshaw went into the finals and Tamblyn did a good job too but was defeated. Brouse, Adams and Mulholland were in the 165, as we had no 155 again. Mulholland and Adams went into the finals. Adams won over Mulholland and surprised himself as much as anyone. Barlow was our heavyweight entry with no takers. Altogether in the junior assault we came out with eight winners which wasn't too bad a show.

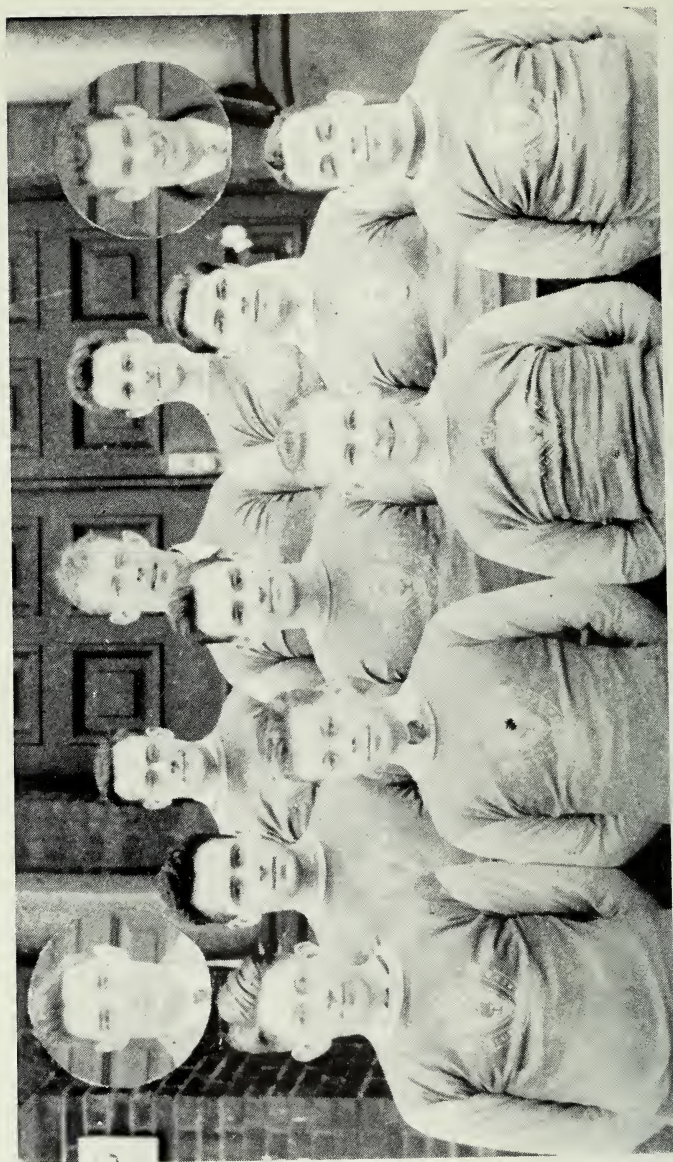
For the senior assault the line up was like this: In the wrestling, we had Joe Heffernan again and Melvanin. Melvanin took the weight. Joe just didn't have any luck. We talked Iglesias and Boland into coming out, just to get points for School in the 145 class and Boland took it. Mills and Arthurs were in the 165 class and both were unsuccessful. Henry went 175 and was unchallenged and Gow in the heavies.

The boxing was light too. Geary boxed 135 and should have had his bout but didn't, he will next year. Mansell came out and made the supreme sacrifice for School, with more condition he could have had it. Weed Quittenton even took out his store teeth and put on the gloves, but condition again did it.

Walt Sharpe, 175, put on an exhibition with Doug Currie, heavy, at the end of the evening. More points for School. There were more bouts lost on condition alone this year than on skill. As it was, we took the senior assault by a narrow margin. The instructors are there in Hart House all year. If we could get a team going in the fall, we'd have a winner in every weight in both assaults next year. Let's go.

ROD RITCHIE, *Manager.*

SWIMMING TEAM



Third Row: C. RIMMER, P. AYKROYD, T. GRAHAM.
 Second Row: P. LOCKHART, J. BRACE, J. MARTIN.
 First Row: W. MACDONALD, D. WHITTINGHAM, L. SOMERVILLE, J. NORTHWOOD.
 Inserts: W. MOFFAT, F. SANSOM.

SWIMMING TEAM

For the third consecutive year School has made a clean sweep of all swimming meets. The strength of School's swimming teams seems to be growing each year.

During the fall term, S.P.S. entered three teams in the Round Robin League of swimming. These three teams established some sort of record by not losing a meet to any other Faculty or College, but all got to the Semi-finals where they proceeded to eliminate each other. First Senior School came up against School Thirds, who with J. T. Sansom, B. McDonald, A. Patterson, G. Boa, J. Boa, put up quite a fight against such swimmers as Moffat, Northwood, Graham, Rimmer, Muller, Payne, Hill and Cornell. In the finals, Junior School who had no opposition throughout the year were quite confident of taking their big brothers, Senior School, and proved that they had reason to be by taking them in two straight meets by the score of 22 to 11. So we have another Interfaculty Championship team in School thanks to F. Sansom, J. Martin, G. Ferrier, P. Lockhart, W. Sharpe, K. Sharpe, D. Whittingham and B. Gilbert.

Next on the swimming program of the year was the Junior Interfaculty Swim meet which seemed to be just a workout for the School swimmers and had such an entry to gain over 300 points for the well known trophy of Mr. Reed. In this meet School massed more points than all the other Colleges put together.

From all these Swimming Teams, a team to represent School in the Senior Interfaculty Swimming Meet for the Fitzgerald Trophy was picked. The team consisted of Fred Sansom, Johnny Northwood, Bill Moffat, Jim Martin, Bill McDonald, Dave Whittingham, Tom Graham, Pete Aykroyd, Lorne Sommerville, Charlie Rimmer and proved their worth by again cleaning up.

In closing, the Schoolmen who swam for the U. of T. Varsity team this year deserve a bit of special mention. Fred Sansom who last year swam for the team, again filled his place as the expert middle distance swimmer of the University. Beside him swam a freshman, Jim Martin, who shows great promise as a distance swimmer. Bill Moffat, Tom Graham and Pete Aykroyd who were all on the team last year filled the sprint positions on the team. Johnny Northwood, another of last year's team, and another freshman were the backstroke swimmers for the Varsity squad. With Bruce Gilbert as the breaststroke swimmer and Lorne Sommerville as the diver of the team, it can easily be seen that the Varsity team was almost all Schoolmen.

JOHN NORTHWOOD.

UNIVERSITY OF TORONTO CONTINGENT CANADIAN OFFICERS TRAINING CORPS

"At the conclusion of this year's Camp at Niagara-on-the-Lake the Contingent will have completed one of the most intensive and successful training programmes of its history", stated Lieut.-Col. H. H. Madill, V.D., Officer Commanding, University of Toronto Contingent, C.O.T.C., at a recent interview.

His message to all ranks at the beginning of the training season was chosen from the first axiom of the Principles of War, "The Maintenance of the Objective". He stated "the first job of every member of the Contingent is to build up our unit to a high standard of efficiency and to maintain it at that high level". That his message was taken to heart, was clearly shown at the annual inspection. The boys did their work with such zest and efficiency that they earned the highest commendations from the D.O.C., and his representatives. Particularly the inspecting officers mentioned the fact that cadets called from the ranks at random could step out and instruct a squad clearly, and with confidence, in any phase of the work in progress.

Lieut.-Col. W. S. Wilson, E.D., Officer Commanding the Second Battalion, and Second-in-Command of the Contingent, was equally enthusiastic over the way the members of his Battalion quickly organized and swung into their training. Many of them had had no previous training, yet they covered their basic training syllabus with thoroughness and efficiency, and made a most satisfactory showing at the D.O.C.'s inspection.

The secret of reaching a high efficiency in military training lies in a sound logical training programme following a definite sequence, and planned far ahead. Under the direction of Major M. B. Watson, E.D., Chief Instructor of the Contingent, and Major G. R. Lane, Chief Instructor of the Second Battalion, the programme for the year was carefully worked out. This involved much study and burning of the midnight oil by the junior officers in preparing their work, but results justified the effort.

The major change in the syllabus, due to regulations governing the Canadian Army (Reserve), has been the discontinuance of the courses leading to qualification of 2/Lieut. (Res.) and the adoption of a syllabus designed to give cadets a solid foundation in basic and special to arm training. Thus on entering O.T.Cs.' cadets will be on an equal footing with candidates from the

Canadian Army, Active, who have had long experience in this phase of the training in Canada and overseas.

Regimental Schools were established and continuous courses were conducted throughout the season qualifying the candidates as non-commissioned officers or as instructors in platoon weapons and in chemical warfare. These were under the direction of Major H. C. H. Miller and Capt. A. Ragen, Contingent Headquarters staff.

While most of the "School men" are in the Engineer training companies, many are in the Artillery, Machine Gun, Army Service Corps, and other wings. This year will probably break the record for the number of engineers entering active service.

The following are brief summaries of the activities of the companies in which most of the Engineering students train. Most of the officers of these companies are graduates of the old School, and the Company Commanders, called affectionately off parade by their first names, are known throughout the whole Canadian Army wherever Engineer officers meet.

"B" Company—Under the Command of Major H. W. Tate.

The Engineers
Have hairy ears
And hairy harried faces;
Robust and rough
They do their stuff
In all the toughest places.

"B" Company Engineers started the 1942-1943 training with over two hundred cadets, one of the strongest companies in the First Battalion of the C.O.T.C.

The work before Christmas was almost entirely basic training, but after Christmas the Company was divided in two, the right half carrying on with engineer lectures and practical work, while the left half continued with basic training.

On the 27th February, 1943, the right half company was inspected by the representative of the D.O.C., Lt.-Col. F. S. Milligan, District Engineer Officer, and gave a demonstration of bridging, building rafts, placing demolition charges, erecting derricks, gyns, etc.

It is expected that some 75 members of this right half company will commence active service training early this summer.

The following are Company officers:

T/Capt. C. P. Thompson	T/Lieut. K. A. Cameron
T/Capt. A. R. Smyth	T/Lieut. L. G. Baker
T/Lieut. S. R. Kent	

"C" Company, Ordnance Mechanical Engineers.

The Ordnance Mechanical Engineers have completed a very busy year under Major W. E. P. Duncan. Instruction was given in special to arm, motor mechanics, guns and instruments. An Ordnance Engineer must know the set up from base workshop to the L.A.Ds. He must tackle anything from a Churchill tank to a typewriter. "What makes it tick?" is his eternal problem. Among many of the activities this year they stripped an old T.T.C. bus from the engine to the tail-light, and re-assembled it. Who knows but what the gallant Major and his boys will roll up to parade in it next year to the envy of the whole Battalion.

The following are the Company officers:

2/Lieut. B. O. Dick	2/Lieut. D. J. Tidy
2/Lieut. D. J. McChesney	2/Lieut. L. F. C. Pepino
2/Lieut. H. A. Phillips	2/Lieut. F. P. Shand

They all attended the Ordnance Summer School at Barriefield, specializing in Ordnance work, in 1942.

"D" Company (Signals).

In addition to the basic training taken by all companies of the 1st Bn., "D" Coy., under the command of Major G. T. Hodgson, specialized in the work of intercommunications. Under this heading may be grouped, Wireless, Telephone work, Telephone Switchboard operating, Cable laying, Signal office duties and Signal Organization. Extensive code practice was undertaken in order that the majority of the members of the Company would achieve a code speed of six words per minute or better.

During the term the equipment has gradually been increased from three No. 1 Wireless sets to an addition of two No. 9 Wireless sets. This is over and above the regular telephone equipment.

Approximately fifty trained signalmen will be proceeding early this summer from "D" Company, to the Signals wing of the O.T.C. at Brockville. It is expected that about five IIIrd year Science men from "D" Company will take the three-month signal

course at Barriefield this summer. These will be part of a group of 35 men drawn from all the universities of Canada.

The following are Company officers:

Capt. B.C. Diltz	2/Lieut. R. W. Hipwell
2/Lieut. C. Hopkins	2/Lieut. T. J. Hogg

Second Battalion—"S" and "T" Coys.

All S.P.S. men taking 1st year basic training belong to "S" and "T" Companies of the 2nd Battalion, U. of T. Cont. C.O.T.C.

For the year 1942-1943 all 1st year men less "Civils" were members of "S" Coy., commanded by Capt. W. V. Tovell, a member of the Maths. & Physics Department of Oakwood Collegiate Institute.

First year "Civils" and all other S.P.S. men taking 1st year training were members of "T" Coy., commanded by Capt. J. H. Horning, Assistant Principal of Oakwood Collegiate Institute.

Both companies were extremely large, commencing the year with over 300 in each company. To this was added the difficulty of the shortage of trained instructional staff. Both Platoon Commanders and N.C.O's., had to be found and trained to fill nearly all posts. "T" Company, for example began the year with two Pl. Comdrs., and six N.C.O's., from the "T" Company Staff of the previous year.

However, staffs were found and trained, and the difficulties were overcome with highly satisfactory results.

More training equipment being available, all ranks have benefited by a more practical training than has been possible during previous years. It is expected that a considerable part of the present staffs will be able to stay with these Companies next year and thus give continuity to the training.

The following are Company officers:

"S" COMPANY

Capt. D. B. Murray
 Lieut. J. R. Shires
 Lieut. J. M. Stephenson
 Lieut. M. L. Bunker
 Lieut. D. G. Dewar
 Lieut. E. P. Harrison
 Lieut. C. E. Carbin
 Lieut. F. P. Mallon
 Lieut. F. M. Near

"T" COMPANY

Lieut. G. E. Davidson
 Lieut. A. P. Quentin
 Lieut. L. E. Drake
 Lieut. H. D. Perrin
 Lieut. G. Macdonald
 Lieut. W. R. Evanson
 Lieut. A. Stark
 Lieut. A. Clarke, M.C.

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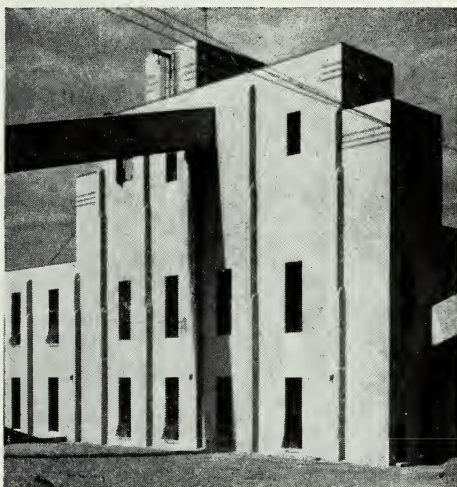
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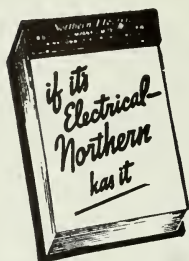
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The customers fled in a hail of bullets—all except an Englishman, who stood at the bar calmly finishing his drink. "Well?" snapped the gangster, waving his smoking gun.

"Well," remarked the Englishman. "There certainly were a lot of them, weren't there?"

"Winter draws on," remarked Hank as he tucked Muriel into the old fashioned sleigh last winter. "Is that any of your business?" answered Muriel coldly.

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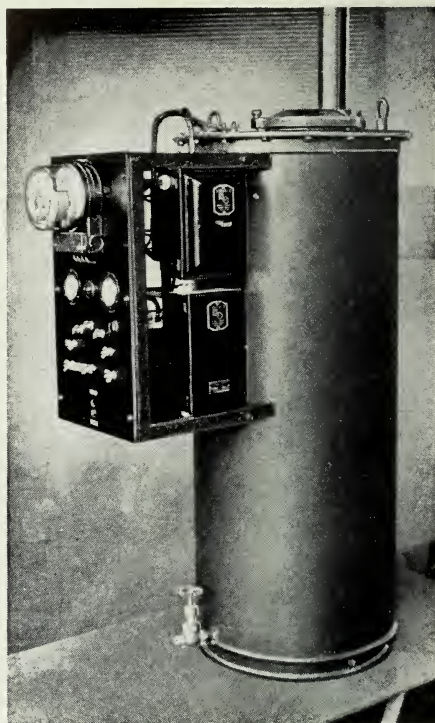
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